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Dear Readers!

We are pleased to provide you with **the Thrid edition of *Intercathedra 2011***. This edition, which publishes a range of scientific papers from various universities, resulted from co-operation of Central European academic research centers. The papers primarily relate to economic issues in the following areas: economy, management and marketing, especially but not exclusively, in the forest and wood products industry as well as other related fields.

International scientific collaboration presented in *Intercathedra 2011* links a number of cities: Poznań (the Host City), Brno, Košice, Kraków, Presov, Tarnów, Trnava, Warszawa, Zagreb, Zvolen, Žilina and other Polish and foreign scientific centers. The *Inthercathedra* brings together the university cities, departments, but first and foremost it unites people. We invite you to cooperate with other cities and research centers.

In response to a significant interest in our scientific journal, Members of Editorial Committee decided that starting from 2011 - The **INTERCATHEDRA** – a Scientific Bulletin of the Economics Departments of the European Universities, will be published regularly as a Quarterly.

This edition marked as 27/3 includes, inter alia, papers presented at the “Economic Forum 2011”, held in Laski near Kępno (the conference center of Poznan University of Life Sciences) on 13 - 15th September 2011, which concerned the *“The conditions and development perspectives of wood industry enterprises in the situation of recovering from the economic crisis in Europe and the World”*.

Academic conferences known as “**Economic Forum**” are taking place annually since the early nineties of the 20th century. According to the tradition, Economic Forum 2011 was organized by the Department of Economics and Wood Industry Management in Poznan University of Life Sciences, in cooperation with:

- IATM - International Association for Technology Management,
- Forest Experimental Station in Siemianice,
- SITLID-Wood Section of the Association of Engineers and Technicians of Forestry and Wood Industry in Warszawa,
- Institute of Wood Technology in Poznań.

Economic Forum 2011 was already the 27th international scientific meeting of the university staff conducting scientific work in common and related areas of research. This meeting gathers engineers, specialists in particular sectors, as well as young scientists and entrepreneurs. These initiatives are supported by IATM - International Association for Technology Management - an international scientific organization, which brings together universities of Central Europe that are conducting research in the field of economics and management in industry, in particular in the forest and wood industry.

Intercathedra 2011 has been issued under the auspices of IATM, whose members provided materials for the volume, were responsible for its review, and prepared the both mentioned scientific conferences. They deserve our deep gratitude.

Wojciech Lis



Monika Fedorčáková, Peter Poór¹

IMPACT OF EXCESSIVE STOCKS IN PROCESS OF BEARING STOCK OPTIMIZATION USING BRANCH AND BOUND METHOD

Abstract: Supply process is one of major priorities for each manufacturing plant. To produce quality products with low prices is an advantage in competition on the market. A prerequisite for such a state is to minimize prices of production inputs, which can be achieved by stock optimizing. Presented contribution on specific example illustrates discrete optimization process on principles of Branch & Bound, which defines the input, and optimized parameters of initial stock of bearings in selected companies operating on Slovak market. In conclusion, the impact of optimized solutions is given and highlights the need for optimization.

Key words: Branch & Bound, impact, stocks, optimization.

INTRODUCTION

Today, if the company has to be competitive, it is not enough only produce quality products at low prices, issue of environmental protection is also important. And just minimizing of inventory stocks is a significant contribution to reduction of environmental burden and hence a more favorable environmental impact. Optimization is possible implement on basis of many approaches, one of them is basis of Branch & bound method, which is one of main tools for solving discrete optimization problems. Main objective of this method is to find the minimal or maximal value of x in admissible solutions. When minimizing this may be for example time, when maximizing, it can be valuation. Next part is a concrete elaboration in case of absolutely determined uneven consumption of item: bearings used in gearbox manufacturing.

1. APPLICATION OF BRANCH & BOUND METHOD

The purpose of this method is determining the optimal number and size of orders so that costs of order together with costs of storage over a period T were as low as possible = optimal [8].

Description of input optimization

The SJT Company, Ltd., Moldava n/B, which is focused on production and sale of mechanical power, forming machines, castings from gray cast iron and nonferrous metals for year 2011 following plan of production was established for gear type TS 031 444.EJ:

Term	1	2	3	4	5	6	7	8	9	10	11	12	Total
Number /PCS/	51	51	66	76	84	47	39	65	98	86	52	97	812

According to production plan in company was established required amount of deposits in next 12 months:

Term i	1	2	3	4	5	6	7	8	9	10	11	12	Total
Time (months)	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	
Quantity (pcs)	102	102	132	152	168	94	78	130	196	172	104	194	1624

Costs for one order:

Price for one piece	6,50 €
Area rent	40 €/m ³
Costs connected with one order (transport)	36,4 €
Bearing dimensions	45 x 100 x 25

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Bearing weight 0,830 kg

$V = \pi \cdot r^2 \cdot v = 3,14 \times 0,502 \times 0,25 = 0,19625 \text{ dm}^3 = 0,0002 \text{ m}^3$

Costs share from storage = rent x part volume x utilization rate = $40 \times 0,0002 \times 2 = 0,016$

$C_s = 36,4 \text{ €}$

$C_1 = 6,50 \times 0,03 \times 0,016 = 0,211 \text{ €}$

Based on warehouse evidence of SJT, s.r.o., Moldava nad Bodvou company, real stock level of bearings is:

Term	1			4		6			10			12	Total
Stock level	400			340		410			450			24	1624
Optimal level	102	102	132	152	168	94	78	130	196	172	104	194	1624
Difference	298	196	64	252	84	400	322	192	446	274	170	0	

Assuming that we do not focus on terms of orders and we know that cost of one order is 36,4 € and cost of maintaining stocks are worth 0,211€ we determine the replenishment process. The following table shows the calculated cost of $n(i, j)$:

i \ j	1	2	3	4	5	6	7	8	9	10	11	12
1	36,4											
2	<u>57,92</u>	36,4										
3	113,62	<u>64,25</u>	36,4									
4		128,4	<u>68,47</u>	36,4								
5			139,37	<u>71,84</u>	36,4							
6				111,52	<u>56,23</u>	36,4						
7					89,15	<u>52,86</u>	36,4					
8					171,44	107,72	<u>63,83</u>	<u>36,4</u>				
9							146,54	77,76	36,4			
10									<u>72,69</u>	36,4		
11									116,58	<u>58,34</u>	36,4	
12										140,21	77,33	36,4

Costs for bearings quantity, that will satisfy demand in the i - and j -th period and cost of maintaining stocks which incurred by given order, are calculated according to:

$$n(i, j) = C_o + C_1 \sum_{k=1}^j (t_k - t_i) Q_i \quad (1)$$

$$n(1,1) = 36,4$$

$$n(1,2) = 36,4 + 0,211 \cdot (2 - 1) \cdot 102 = 57,922$$

.....

$$n(11,12) = 36,4 + 0,211 \cdot (12 - 11) \cdot 194 = 77,334$$

$$77,334 - 36,4 = 40,934 > 36,4$$

$$n(12,12) = 36,4$$

Elements in the table represent the cost of $n(i, j)$. For example element $n(3,4) = 68,47$ means that if we order together quantity needed for cover consumption in the third and fourth month, we incur budget per order and cost of maintaining stocks of the entire amount for period of one month for cover consumption in the third month in value of € 68.47.

In each column, we can proceed with calculation as long as difference between two consecutive columns does not exceed $f(1)$, i.e. 36,4. The difference is greater than 36,4 in the two consecutive elements of the same column means that cost of maintaining stocks to cover consumption in the month are higher than 36.4. Then it is preferable to cover consumption with new order that will be delivered to consumer at the beginning of period. There is maximal time horizon for each period to be covered with a single order. This fact is underlined in the table marked with the element 16.



The minimum achievable cost of providing stock coverage since the beginning of the planned consumption to j -th period is calculated:

$$f(j) = \min_{i \leq j} [n(i, j) + f(i - 1)] \quad (2)$$

while $f(1) = Cs$

We look for minimal costs and optimal order strategy:

$$f(1) = 36,4$$

$$f(2) = \min \left\{ \begin{array}{l} n(1,2) \\ n(2,2) + f(1) \end{array} \right\} = \min \left\{ \begin{array}{l} 57,922 \\ 72,8 \end{array} \right\} = 57,922$$

$$f(3) = \min \left\{ \begin{array}{l} n(1,3) \\ n(2,3) + f(1) \\ n(3,3) + f(2) \end{array} \right\} = \min \left\{ \begin{array}{l} 113,626 \\ 100,652 \\ 94,322 \end{array} \right\} = 94,322$$

.....

$$f(11) = \min \left\{ \begin{array}{l} n(9,11) + f(8) \\ n(10,11) + f(9) \\ n(11,11) + f(10) \end{array} \right\} = \min \left\{ \begin{array}{l} 363,038 \\ 341,202 \\ 355,55 \end{array} \right\} = 341,202$$

$$f(12) = \min \left\{ \begin{array}{l} n(10,12) + f(9) \\ n(11,12) + f(10) \\ n(12,12) + f(11) \end{array} \right\} = \min \left\{ \begin{array}{l} 386,67 \\ 396,484 \\ 377,602 \end{array} \right\} = 377,602$$

Underlined values represent minimal achievable costs. Achievable minimal costs are 377,602 €.

Determining of optimal value

Optimal order quantity for specified material is 10 orders:

Month	1	2	3	4	5	6	7	8	9	0	1	2	Total
Order (pcs)	02	02	32	52	68	4	08		96	76		94	1624

2. ANALYSIS OF THE IMPACT OF INVENTORY LEVELS IN THE PROCESS OF OPTIMIZING THE STOCK BEARINGS

Effect of stock levels can be evaluated from multiple perspectives, also from an environmental perspective, such a comparison of difference of actual stock and optimal stock levels, or unnecessary surplus stock [10]. While in first case, impact of stock reflected in distribution impact as environment for a longer period of benchmarks in latter case, possible impact of surplus stock attributable to the entire life cycle from extraction of mineral resources through energy consumption to disposal at the end of its life cycle. Industrial technologies consume energy and resources. Sources with products produce waste. Most products change over time into waste, which actually means the burden on environment. Manufacture of bearings is a complicated technological process accompanied by a variety of machine technology and finishing processes. Technological complexity of production significantly affects the economic and financial difficulty and is largely influenced by the environment [12].

Bearings are made of steel, aluminum, brass and iron. For 1 ton of steel produced is consumed 1,3 tons of pig iron. To produce that amount of iron we need 3,8 tons of iron ore, 0,7 tons of limestone and 1,3 tons of coke. During production of pig iron there is solid waste debris. It can be used as an additive in road building or as an ingredient in cement production.

As a result of coke production from coal is dust and sulfur dioxide SO_2 . Technological process of manufacturing bearings starts with turning. This raises the scrap metal (steel scrap, brass, aluminum, cast iron and steel waste piece) even if we use the best material dimensions. As a result of turning is waste from cooling and lubricating means. The next phase of production is phosphate, which gives rise to the emergence of the environmental impact of phosphate sludge, waste water

containing oil and fumes. The manufacturing process continues with calibration, cutting, grinding and deburring. After quenching and subsequent re-phosphate manufacturing process ends and is followed by bearings assembly [17].

There are several ways to reduce the exploitation of natural resources. One option is recycling, which not only slows the depletion of natural resources, but is also economical and environmentally-friendly. As an example, recycling of 1 kg of ferrous scrap can save 4 kg of iron ore and 2 kg of coal. Similarly, production of steel from scrap metal requires less energy and labor-intensive than production from iron ore.

3. OPTIMIZATION NEED

Stock optimization is very important business. When there is a lack of inventory fluctuations in production, and company losses its profits [9] [13] [14]. Conversely, if stock excess inventory, company also losses profit, because its capital is tied in storage. The largest stocks of capital that is tied up in stock in Slovakia has engineering, construction and manufacturing industries [6].

In case, if amount of stock optimization problem was solved using stock theory, we would not have such a big mistake in stock setting. Suitable system of stock management, can we also by [11] reduce the costs of supply, increase labor productivity, which has a positive impact on increases in economic indicators of company and according to [12] [14] also reduce the environmental burden.

CONCLUSION

Global impacts influence lives of everyone directly or indirectly, and therefore all industries should strive to optimize their business processes and in particular with regard to saving scarce natural resources. To satisfy basic life necessities it is needed to contribute by preserving a balance of ecosystems without compromising the diversity of nature. The only option is to reconcile economic development with ecological patterns, as well as through use of optimization principles of Branch & Bound method and thereby contribute reducing the impact of excess stocks.

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Jaroslava Kádárová, Monika Šusterová²

IMPORTANCE OF COMMUNICATION IN RISK MANAGEMENT

Abstract: Effective communication in any business, is one of the fundamental assumptions of its functioning. It is the failure in communication, which often cause problems in management. Management and other employees should endeavour to deal with the principles of effective communication, improve their communication skills and manage effective communication techniques.

Key words: communication, risk, process, risk management.

INTRODUCTION

We all communicate with each other. The question is: How successful? Many people do not feel ready for everyday communication. In today's fast changing world, the need for effective communication is more even urgent. Personal communication is the key in all areas.

The aim of any society is to improve communication, which will benefit not only in many areas, but also in the workplace.

1. THE AIM OF RISK MANAGEMENT

The basic objective of risk management projects is to increase their chances of success and minimize the risk of such failure, which could jeopardize the financial stability of companies and lead to its eventual decline.

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The aim of the project risk management is to identify:

- which factors are most important and could affect the risk of the project, or which factors are less important and could be neglected,
- how big is the risk of the project and whether it is still acceptable,
- what measures can reduce the risk to acceptable level of economic purpose.

Basis of risk management is a certain systematic process of working with risk and uncertainty, designed to improve the quality of training and evaluation.

Risk management projects are divided into the following steps:

- determine the risk factors of the project,
- determine the significance of risk factors,
- risk assessment project,
- project risk assessment and measures to reduce it,
- preparation of a plan of corrective measures [3].

I cannot say it is enough - communicating is the most important responsibility you have as a project manager. Ninety percent of your time is spent in this activity. Of any other element that has not a greater impact on your project's success than good communication. And like risk management, good project communications starts with a plan.

The communications plan works together with the risk management plan to determine who, how, and when information regarding the status of risks and the progress of the response plans gets reported.

The goal of risk management is identifying potential risks, analyzing risks to determine those that have the greatest probability of occurring, identifying the risks that have the greatest impact on the project if they should occur, and defining plans that help mitigate or lessen the risk's impact or avoid the risks while making the most of opportunity.

Risk management means applying skills, knowledge, and risk management tools and techniques to your projects to reduce threats to an acceptable level while maximizing opportunities.

More specifically, risk management concerns these five areas:

- identifying and documenting risks,
- analyzing and prioritizing risks,
- performing risk planning,
- monitoring risk plans and applying controls,
- performing risk audits and reviews [1].

The primary elements of a risk management plan are as follows:

- methodology - this section describes what methods you will use to perform risk management;
- roles and responsibilities - this section includes the roles of all the major stakeholders (including you as the project manager) as it pertains to risk identification, control and most important, the roles of the risk owners, including their responsibilities in implementing and monitoring response plans;
- budget - medium-to-large-sized projects, or those with an extraordinary amount of risks with high impacts, may have a special budget for managing risk. If a risk budget exists, it is documented here;
- risk scoring - qualitative and quantitative analysis processes are used to rank and score risks. This section of the risk management plan should include a description of the scoring method you will use, how you developed the scoring method, and the thresholds that indicate you should develop and implement a response plan;
- reporting formats - this section should detail how the risk management information will be maintained, updated, and reported to project participants;
- tracking - this section includes a description of how will you document the history of the risk activities for the current project and how the risk processes will be audited. You can refer to this

information as you progress through the project and also when you work on future projects that are similar to this one.

2. ITERATIVE PROCESS

Risk management, just like project management, is an iterative process, and effective communication is at its core. Without communication and constructive information exchange between key stakeholders, project team members, management, the project sponsor, and so on, risk management would not work well.

Communicating is the process of exchanging information. Communication has three parts:

- senders' responsibility,
- make the message clear and concise,
- target the information for the right audience,
- avoid unnecessary detail and technical jargon,
- keep it honest.

Receivers' responsibility:

- read and listen to the message for understanding,
- avoid jumping to conclusions,
- interpret the information at face value,
- ask clarifying questions,
- control your emotions.



Pic. 1. Iterative process

Communication is a critical component of successful risk management. Likewise, the amount and method of communication also has an impact on the risk impact and consequences [1].

3. BASIC PRINCIPLES OF COMMUNICATION

Communication level can be characterized by 4 basic principles.

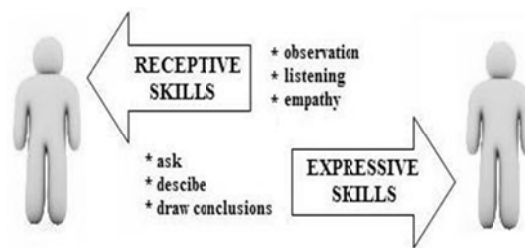
1. Straightness - direct communication means "honest," true "in progress between two people. Direct communication is descriptive, all participants can make a shared vision of what is shared. It is impartial and strategically focused. Straightness is expected and it creates confidence.
2. Respect - the communication partners are treated with respect and they act with him or her as a person, not as a thing. We respect their needs, goals and views and access to the knowledge that each party of the communication brings it a unique and special contribution. Every person has value and potential of specific and therefore has the right to have individual, unique experience and perspective.
3. Shared responsibility - important for the successful conduct of communications responsibility by both parties. All workers and people in the organization at all levels should strive to increase

productivity and better tasks. All the entering into relationships that affect the results are achieved. Each worker must act responsibly when communicating.

4. Objective - aim is to achieve consensus on goals and roles, to analyze and use feedback in order to improve and define educational and professional development. We want to take a decision and solve problems. We always should have a purpose for them.
5. Communication skills; specific to the communication constitutes a "toolbox". The use can affect the outcome of discussions at each stage we choose the most appropriate.

Receptive skills are active communication skills and are used to obtain information.

1. Observation is based on watching what is happening, to determine the impact of individual activities and to determine whether non-standard, unique issue or situation is associated with a particular model.
2. Listening means to hear what was said or implied, to identify key points and issues contained in the sharing and presented in order to verify the accuracy and sharing.
3. Empathy, the ability to empathize with each other, permits the identification of feelings and values and to determine whether they are perceived in accordance with their usual interpretation. Expressive skills are essential for active skills to be able to bring new information to the debate and focus them in a certain direction.
4. Asking helps to find information and opinions, accordingly we get fair and adequate detailed response.
5. Describe identify concrete, specific examples of behavior and its consequences.
6. Draw conclusions articulate and clarify the overall attitude, recommendations and decisions [2].



Pict. 2. Six communication skills

Communication atmosphere in the organization understand the certain characteristics of working relationships that impact on the communication between management and employees and between employees themselves. In addition, personal managers are playing a role and organizational culture, traditions, sometimes the wider social environment. Communication atmosphere may take the form of supportive working environment, supportive atmosphere or closed, atmospheric braking.

Tab. 1. Type of communication atmosphere

Signs promoting the atmosphere	Signs braking atmosphere
<ul style="list-style-type: none"> • factual information, communication is focused more on addressing problems, to seek opportunities, not obstacles, • promotion of positive feedback, recognition of the error and learning from it, • open, fair assessment, to help and criticism is correct, • care, honesty and the pursuit of empathy, • equivalence, mutual respect, sense of security, promoting, good working relationships and high performance. 	<ul style="list-style-type: none"> • tendency to provide negative feedback, highlight errors and weaknesses, negative approach, finding weaknesses, failing finding of guilt, • disregard people and their views and experiences, indifference to their needs and problems, barriers in relation boss - subordinates, • duplicity, manipulation, abuse, • shoddy, highlighting powers.



We mean a steady way to communicate with their co-manager, communication habits, but also its relationship to the objectives, content and forms of communication. We distinguish four basic styles:

- 1) analysis - tend to think more, talk less, checks, it is more passive style,
- 2) management - an independent personality style, ambitious, persevering and careful,
- 3) friendly - sensitive style, leader of good relations in the organization,
- 4) expressive - it is a style-sensitive head, more in each erasure, the tendency to take hasty decisions [6].

Successful projects depend on a solid foundation of clear, frequent communication. Without effective communication, project risks may not be detected, let alone managed [4].

CONCLUSION

Risk Management is about identifying and mitigating risks in its early stage. Therefore, focus should be placed upon risk identification as well as risk analysis and risk evaluation. This requires constant communication between all members of the company, an essential step in Enterprise Wide Risk Management.

Increased communication will be beneficial in many different areas of the workplace. One thing is for sure: moral increases in direct proportion to meaningful and timely communication. But it takes a plan and a commitment from the organization's leaders. It also takes coordinated execution. However, in my opinions, the results are well-worth, the investments.

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KANBAN CONTROLS AND CONSTRUCTIONS DURING INTENSE FLUCTUATIONS IN PRODUCTION USING DISCRETE SIMULATION

Abstract: Nowadays production systems are often controlled by Kanban. An important precondition is that the variation in the production parameters is relatively small. These variations are taken into account in the calculations of a Kanban including a safety factor. The dynamic behaviour of a Kanban will be illustrated by employing discrete event simulation. If the Kanban is close loop controlled, a reduction of the circulating Kanban cards is possible, provided that the cycle time of variation in the output rate is longer than the fourfold cycle time of a container. If a predictive controller is applied, a reduction is achieved as from more than twice the cycle time of a

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container. The control of a Kanban can be done manually; however, the installation of an e-Kanban is a better option.

Keywords: accommodation of Kanban, irregular Kanban, practical Kanban, Kanban with time consuming elements, controlled Kanban, Kanban circuit, minimization of inventory storage

1. KANBAN AND ITS USAGE

Kanban controls are often used, to minimize stocks in production and constructions. This reduction in stock is achieved because the quantity of containers which are available in the Kanban cycle is restricted. The limited amount of containers assumes that the production only fluctuates in constraints which have been known before. Fluctuations in production are often used as an argument against the employment of Kanban. However type and volume of deviations are rarely quantified.

On the one hand deviations in production can be statistically distributed inconstancies in the process chain and on the other hand they can be seasonal. Because fluctuations in productions are dynamic processes and the calculations only deliver statistical values in consideration of accordant safety factors, an ideal accommodation on the conditions of production isn't possible. Weber mentions the accommodation of Kanban within a production planning without quantifying in detail.⁴ Moritz describes a very extensive and a strongly regulatory influenced approach for the accommodation of Kanban.⁵ A regulatory consideration indeed gives similar values in discrete processes but as an analogical mathematical model it can't state the values precisely⁶. The usage of the discrete simulation for accessing the effect of fluctuations in production on a Kanban control can provide more accurate values for construction.

2. CONSTRUCTION OF A KANBAN CONTROL

With regard to the employment of the discrete simulation the usual Calculation procedure is deviated. All elements of a Kanban circuit only are interpreted as a time consumer (fig. 1).

Four elements were defined as time consumer for the simulation:

- manufacturer, t_{Man} : time it takes to manufacture or rather to supply a full container
- material handling, t_{Trans} : time it takes to transport a full container from the manufacturer to the consumer
- consumer, t_{Cons} : time which is required to discharge the container
- kanban card, t_{Info} : time for the return of the Kanban card or the empty container from the consumer to the manufacturer.

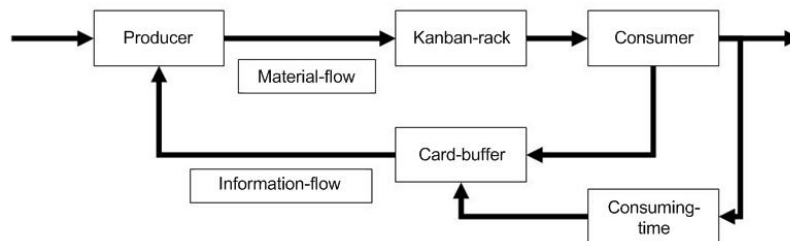


Fig. 1. Controlled Kanban

Based on this demonstration the number of containers in the circuit N_{Con} is calculated with the replacement time t_{Rep} , the consuming time t_{Cons} and the minimum inventory level S :

⁴ Cf. Weber 2008, p.94 and p. 105

⁵ Cf. Moritz 2000

⁶ Cf. Barbey 2008, p. 361



$$N_{Con} = \frac{t_{Rep}}{t_{Cons}} + S = \frac{t_{Trans} + t_{Info} + t_{Man} + t_{Cons}}{t_{Cons}} + S$$

The significant difference to the ordinary calculation equation is the minimum inventory level S which appears through additional containers in the Kanban shelf. Usually the minimum inventory level is a multiplicative factor in the construction.⁷ In the following simulation the safety stock is used as a selected value, which regulates the quantity of the cards in the Kanban circuit. If all time values are constant, the necessary quantity of cards is constant as well.

For the simulation one expects that the consuming time of the container is the only parameter which diversifies. This signifies that in real systems a production or construction can follow every change in the acceptance of the products, for example by a personal increase. This interpretation signifies an idealization, because except for the consuming time all other times have been kept constant. Own plausibility considerations at the described simulation model showed that the maximum influence is due by the change of the consumption time.

Because of the changes of the consumption times the minimum inventory level in the Kanban fluctuates, too. Compared to a Kanban according to Image 1 the circle is extended by the capture of the consumption time (fig. 1).

By the capture of the consumption time the Kanban has to be adjusted by the removing or adding cards according to formula 1, with the goal to keep the minimum inventory level S as constant as possible.

On the one hand, this kind of construction signifies a rejection of the present usage which defines the Kanban as a once fixed production unit.

On the other hand this approach results in additional expenses because of the capture of the consumption time and the adaption of the number of cards.

3. SIMULATION

Based on the conditions which have been arranged in section 2 the Kanban circuit has been represented as a discrete simulation model (fig. 2). With this model different simulation runs have been arranged. To determine the characteristic attitude, the consumption time has been randomly changed. In a further simulation line the consumption time has changed on a harmonious function. The simulation model has been constructed, so that irregular as well as regular parameter runs could be realized.

3.1 Behaviour of the irregular Kanban

The Simulation of the irregular Kanban helps to resolve the generally time response and provides the base values for the regular Kanban. At fig. 3 the developing of the minimum inventory level is demonstrated when the consumption time of a container changes erratic.

In order that a preferably general demonstration can be achieved, the simulation time as well as the consumption time of a container has been referred to the time of circulation of the container. On the erratic change of the consumption time a continued decrease or increase of the minimum inventory level follows, like expected. After a completed container circulation a stable state appears again.

⁷ Cf. Koether 2008, p. 112

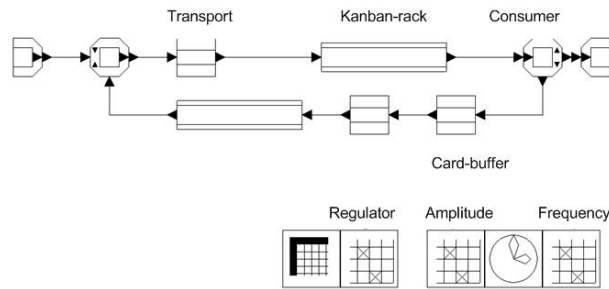
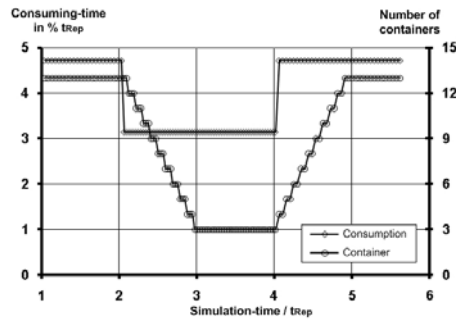
Fig. 2. Kanban circuit as simulation model⁸

Fig. 3. Number of containers in the buffer during erratic Changes in the consumption times

A similar behaviour can be observed if the consumption time changes on a harmonious function. This harmonious function can be considered as a simulation of a trend as for example a seasonal fluctuation (fig. 4).

If the consumption time changes across the simulation time after a harmonious function, the container number of the minimum inventory level fluctuates between a maximum and a minimum and a phase difference of a half period to the consumption time.

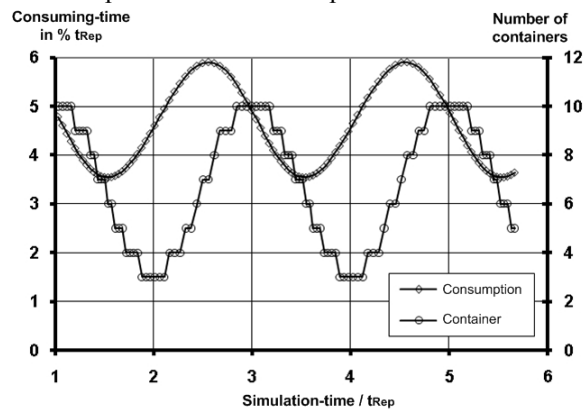


Fig. 4. Number of containers in the buffer during a harmonious change of the consumption time

⁸ Cf. Dosimis

3.2 Behaviour of the regular Kanban

The following simulation runs determine the control mode of Kanban:

- arrangement of the number of containers at sinusoidal change of the consumption time of the container,
- predictive control at sinusoidal change of the consumption time of the container,
- adjustment of a statistically distributed consumption time of the swale.

The results of the first two test runs are referred to the irregular case to enable the judgment of the behavior of the regular Kanban in which the quantity of the cards continuously is adjusted. The fluctuation of the minimum inventory level in the regular case is referred to the fluctuation in the irregular case corresponding to fig. 4. The periodical Change of the consumption time is specified in units of the time of circulation of the container. Thus results a function of strengthening as at Image 6 demonstrated. The amplitude of the change of the consumption time has almost no influence on the control process at the construction of the relative difference of the inventory. Therefore it isn't observed further at the simulation. In contrast the relative time of oscillation has an essential influence. In the area, where the relative time of oscillation is 1, the Kanban determines in the resonance quasi as a "logistic oscillating circuit". You achieve a heavy super elevation of the signal and a consequently deterioration compared to the irregular case. When the relative cycle duration is 4, the result at the control on the consumption time equates the result of the irregular case. At higher cycle duration, a revision is achieved. Here the predictive control is definitely better.

Is the relative cycle duration 2 or higher, the result is under the result of the irregular cycle. Is the cycle duration higher than the fourfold of the time of circulation of the container, you can completely compensate the harmonious disturbance with a predictive control system.

Definition of the axes:

Relative period: Cycle duration of the change of the consumption time referred to the replacement time t_{Rep}

Relative difference in storage: difference between the maximal and the minimal inventory of the regular Kanban in reference to the difference of the irregular Kanban.

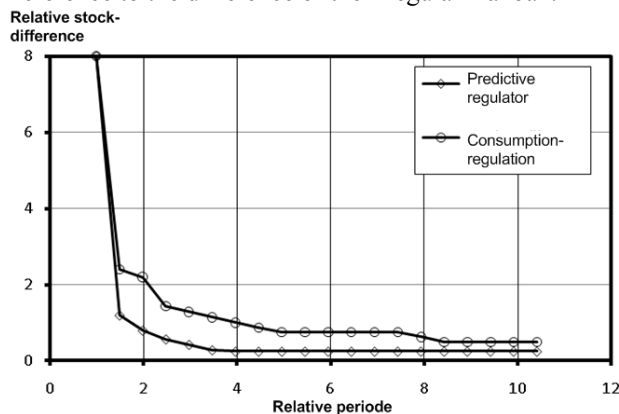


Fig. 5. Function of the reinforcement of the regular Kanban

Fig. 6 shows the change of the allocation of the inventory by activating the control. The obliged value is exactly achieved, but the control collapses at a statistical arranged signal. The fluctuation of the allocation of the inventory gets increased by the control. Because of qualified arrangements of filters, the fluctuation in the simulation can be eliminated. But the regulation algorithm, which has been developed for the disposed simulation model, is such complex, that it doesn't lend itself for a manual conversion in a Kanban. Therefore the algorithm will be not explained at this point.

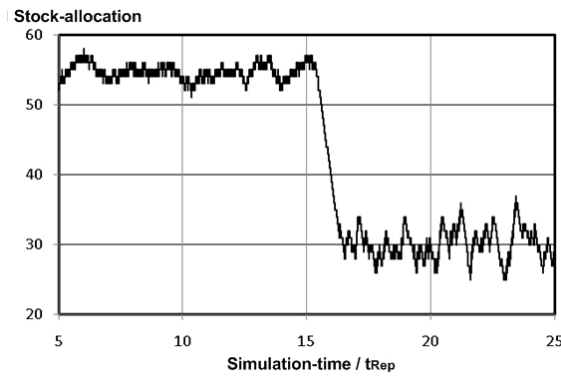


Fig. 6. Adjustment control on the reference value of the allocation of the inventory at a superposed statistical disturbance of the consumption time

4. CONVERSION IN THE PRACTICAL EXPERIENCE

The Advantage of conventional Kanban controls is, that they have to be created once and then there is not any further amount of control installation required. To keep the advantages of the minimisation of the inventory and the short cycle times during fluctuating production conditions, the Kanban circuit can be regulated by adjusting the number of cards. This certainly denotes additional investment at the consuming position, because the consumption time of a container has to be determined additional.

This can be made manual, as well as the removal or the adding of Kanban cards. In case that the characteristic of the Kanban cycle has been determined before, the control process can be conducted manual according to formula 1. Circular changes can be compensated excellent. The compensating of statistically distributed changes results with the facile used rule algorithm, according to formula 1, in great fluctuations. If the rule algorithm becomes optimized, it becomes such complicated, that a manual operation does not seem meaningful. But then it is absolutely possible to use an e-Kanban with a barcode-system⁹, because the rule algorithm can be implemented in the computer. Interesting is the deployment of a predictive control. So the Kanban becomes a component of a production planning. The production planning pretends with this a prospective signal, which is entered into the Kanban circuit. The change of the quantities of the Kanban cards, which follows from this, can be effected “by hand”. However the deployment of e-Kanban is here more sensible, too. With the deployment of a predictive control, the Kanban has been returned to its original function, even the compensation of statistical fluctuations in production.

5. SUMMARY

Today Kanban controls are adopted for the control of production systems. The intention is a minimization of the inventory. An important condition is that the production parameters only fluctuate in closely constraints. With the aid of the discrete simulation, the dynamic attitude of a Kanban is demonstrated. Moreover a control becomes integrated in the Kanban. This control is based on the captured consumption time of a container. So the control adapts the quantity of the Kanban cards. It shows, that the Kanban at periodical changes of the consumption time, below the fourfold time of circulation of the container behaves as a “logistic oscillating circuit” and that the inventory of the containers compared to the irregular case actually rises.

In contrast, an inventory reduction will be a result during longer periods. In the commitment of a predictive control, it is possible to achieve an improvement in periodic fluctuations, when the

⁹ Cf. Weber 2008, p. 166ff.

double time of circulation is arrived and when the fourfold of the time of circulation is arrived, the fluctuations can be completely compensated. The assimilation of the Kanban cards can be effected manual, but it is more reasonable to apply the e-Kanban.

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THE SME SECTOR IN POLAND IN TERMS OF THE FINANCIAL CRISIS

Abstract: The article presents the state of the sector of small and medium enterprises in Poland in years 2005 - 2010. The article presents the importance of SMEs in the national economy and principal factors determining the condition of the sector. Particular attention was paid to the impact of financial crisis on the sector of small and medium-sized enterprises and their behavior and exit strategies.

Key words: SME sector, financial crisis, financial condition

INTRODUCTION

The experience of countries with developed market economy suggests that the development of small and medium-sized enterprises (SMEs) is necessary for the proper functioning of the economy and its mechanisms. In Poland, after a period of transformation, flourishing growth can be seen in this sector, which largely relies on creativity, entrepreneurship and private property. Today, companies belonging to the sector of small and medium-sized enterprises represent 99.8% of active companies in Poland. Their condition and prospects greatly reflects the entrepreneurial potential of society. Entities of SME sector are more flexible than large companies and quickly adapt to market requirements.

This article includes the results of studies concerning the analysis of the behavior of small and medium enterprises in the financial crisis. It answers the question of how the SME sector felt the effects of financial crisis, whether he was ready for him, and how the crisis affected the condition and future business. To achieve its objective the study was based on data from the GUS (Central Statistical Office) and results of the survey from PARP (Polish Agency for Enterprise Development)¹¹.

CONDITIONS OF FUNCTIONING OF THE SME SECTOR

The SME sector is the foundation of not only Polish but also European economy. It creates an essential part of national product and is a major source of jobs. The proper functioning of small and medium-sized enterprises is affected not only by its manpower but also the policy of government

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¹¹ Uses the results of report: *The investment processes and strategies of companies during the crisis, conducted by the Polish Agency for Enterprise Development.*

and local authorities. Stable macroeconomic policies creates the appropriate environment, which is an incentive for new entrepreneurs, able to work at their own risk (Strużycki, 2002).

The activities of enterprises in the economy is dependent on several factors, according to strength of their impact and their source. These factors can be divided into several groups, such as: legal and institutional factors, economic factors, social and cultural factors, local and personality factors (Bieniok, 2005). It is also oftenly pointed at the insufficient actions undertaken by the government to improve this sector's situation (Kozera, 2010), as well as the impact of Poland's accession to EU and the unprecedented level of possible support that can be acquired. Also the legislative changes of 2008 and 2009, which were geared towards the improvement of Polish economic law, cannot be forgotten. Largely depends on these changes the volume of funds accumulated to finance current operations and further development largely depends on these new regulations (Michalczyk, Przychocka, Sikorski, 2008). The study includes mainly macroeconomic factors, as these reflect the impact of global crisis on the economy best. Attention was paid primarily to the size of gross domestic product and domestic demand.

In the years 2005 - 2008 GDP increased from 5 to 7%, this increase could be observed between 2006 and 2007 particularly. End of 2008 brings the first effects of the global financial crisis, which, in case of Poland, is going to be felt most severely in 2009. Although Poland was the only European Union country that recorded economic growth, its rate decreased markedly significantly, from 5.1% in 2008 to 1.7% in 2009. The lowest GDP growth was recorded in the first quarter of 2009 - it was less than 0.4%. After a very difficult year 2009, the economic situation has improved and domestic product reached 3.8% in 2010, which can prove the economy getting out of collapse.

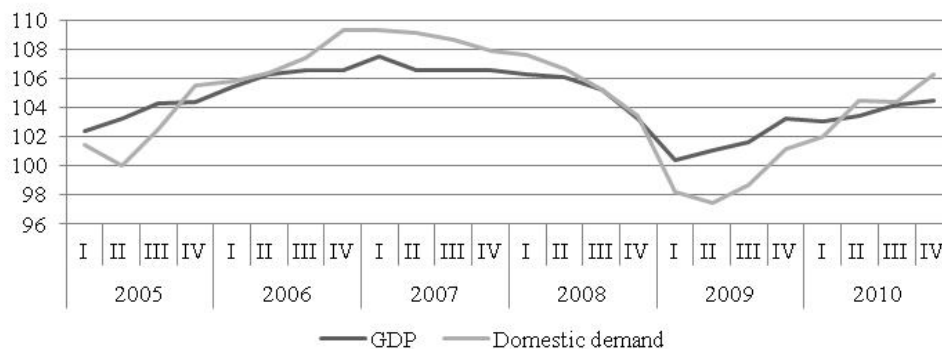


Figure 1. Quarterly GDP growth and domestic demand in the years 2007 - 2010 (in %, constant prices)

Source: Own calculations based on GUS data.

One of the decisive factors of GDP growth is domestic demand, which stimulated economic growth till mid - 2008. During this period, rate of growth of domestic demand was much faster than GDP growth. In 2009, domestic demand fell by 1.2% over the previous year, which was also reflected in the slowdown in GDP growth. Although household consumption was not restricted, its growth rate was lower than the year before. This can also be deduced from the evolution of consumer confidence indicator (as shown on table 1)¹². It is easy to notice that its value began to decrease already in the last quarter of 2008 and the lowest value was obtained in 2009. During this period, deterioration in consumer sentiment was visible in their purchasing decisions.

¹² Consumer confidence indicator - average of balances of rating changes in financial position of the household, changes in general economic situation of the country and the current make important purchases (www.stat.gov.pl).



Table 1. The index of consumer confidence in the years 2007 – 2010

CCI	2007				2008				2009				2010			
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
	- 11	- 6,7	- 6,5	- 4,4	- 5	-5,9	-7,5	-13,7	-25,3	-25	-21	-19	-17	-15	-16,1	-19,1

Source: Own calculations based on GUS data.

Slowdown in GDP growth can be seen on the investment side. Banks tightened their lending policies and pace of FDI inflows has been reduced. Although Poland is still well regarded as a country - recipient of foreign direct investment, their inflow decreased from 10 billion Euros in 2008 to 8.3 billion Euros in 2009. The strong influence of the level of FDI on GDP can be proven by a high degree of correlation between these values, amounting 0.83.

THE FUNCTIONING OF SMALL AND MEDIUM - SIZED ENTERPRISES IN THE POLISH ECONOMY IN THE YEARS 2005 - 2010

In developed countries, small and medium enterprises are considered to be the engine driving the economy - they are the largest group of businesses, create a significant part of GDP and jobs. The share of medium and large companies in Poland and the EU is at a similar level. The differences primarily concern participation of small and micro enterprises - in the EU there is twice as high proportion of small firms, which is compensated in Poland by the greater number of micro - enterprise. This may indicate problems of micro enterprises in Poland in the transition to a higher level of development, that is increasing the size of the employment to more than 9 persons (Entrepreneurship in Poland, 2010).

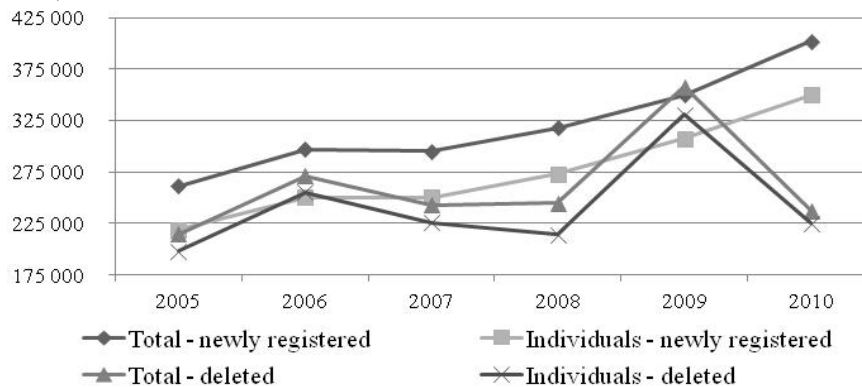
Table 2. Number of entities registered in Poland and their structure by size classes

Number of entities						
	2005	2006	2007	2008	2009	2010
Total	3 615 621	3 636 039	3 685 608	3 757 093	3 742 673	3 909 802
0 – 9	3 436 841	3 455 565	3 502 303	3 568 137	3 548 354	3 713 677
10 – 49	145 745	147 393	150 128	154 833	159 705	161 550
50 - 249	28 343	28 406	28 462	29 323	29 730	29 731
250+	4 692	4 675	4 715	4 800	4 884	4 844
Structure (%)						
Total	100	100	100	100	100	100
0 – 9	87,90	88,38	89,58	91,26	90,76	94,98
10 – 49	3,73	3,77	3,84	3,96	4,08	4,13
50 - 249	0,72	0,73	0,73	0,75	0,76	0,76
250 +	0,12	0,12	0,12	0,12	0,12	0,12

Source: Own calculations based on GUS data (Bank of Local Data).

There were nearly 4 million registered companies in Poland in 2010. That number of these entities was the highest during the analyzed period and was 8.1% more compared to 2005 (Table 2). In the total number of all firms, there is less than 5 thousand of large enterprises (0.12%) and the rest consists of companies from the sector of small and medium - sized enterprises (98.8%), which is dominated by micro enterprises, whose number in 2010 was 3.7 million, and that was about 8,1% higher than in 2005. During that period the largest increase in percentage was achieved by small enterprises, which were 11% more numerous than in 2005. Analyzing the structure of the entities can definitely point to dominant and growing position of micro enterprises, which in 2010 accounted for less than 95% of all registered entities in Poland. Analyzing individual years of the period, it can be concluded that the weakest year for SMEs was 2009, in which the number of micro enterprises has decreased compared to the previous year by 0.6%, that is by almost 20 thousand.

Analyzing the number of newly registered entities, we can see that with each passing year there are more registrations. It should be also mentioned that during that period the number of entities registered exceeded the number of subjects deleted from the REGON (Domestic official public register of entities of national economy). The only exception was in 2009, in which the number of companies which were closed was about 23 thousands more than those newly registered (respectively 330 570 deleted and 307 778 registered). This situation was due to introduction of a new classification of PKD 2007 and the consequent updating of the REGON register. The increase in the number of deleted entities may have also been affected by the economic slowdown, resulting in serious problems with financial liquidity some enterprises encountered (*Entrepreneurship in Poland, 2010*).



Figures 2. Entities of national economy of newly registered and deleted from the REGON register in the years 2005 - 2010

Source: Own calculations based on GUS data.

THE FUNCTIONING OF SMALL AND MEDIUM-SIZED ENTERPRISES DURING THE FINANCIAL CRISIS

Prospects for the market environment have undoubtedly suffered serious deterioration during the financial crisis. The research conducted by PARP shows that a significant part of enterprises from the SME sector has not suffered from the effects of the crisis and assess their condition as very good or good (41%), 45% of companies were not fully able to define their situation as good or bad, while only 10% defined the condition of company as poor (Table 3).

Table 3. Rating the condition of the company

	Total	Self-employed	Micro Enterprises	Small business	Medium Business
Very good	2%	1%	4%	5%	6%
Rather good	39%	40%	36%	35%	29%
Neither good nor bad	45%	47%	48%	54%	57%
Rather poor	8%	6%	8%	4%	3%
Very poor	2%	1%	1%	0%	1%
Do not know / refused	4%	5%	3%	2%	4%

Source: The investment processes and strategies of companies during the crisis, PARP, Warszawa 2010.

During the crisis, companies had to face many challenges - reduced demand or restrictions in access to external funding. The main symptom of worsening in the functioning of enterprises from the SME sector was lower number of orders and a decline in turnover (85% of responses).

The decline in turnover was caused by declining consumer spending dynamics of households. In the face of financial crisis, households reduced consumer spending to increase savings. Another effect less felt by companies, was the decline in profitability of business (27% of responses), and late payment (24% of responses), which are phenomenon typical for any recession. Declining profitability of companies is more dangerous for larger - scale business, that is why it affected only medium - sized enterprises (over 50% of responses).

In the face of crisis, the entrepreneurs had to face many challenges - reducing costs, reorganization of operations and identifying new targets. Companies in the SME sector as a major threat to functioning of his company pointed the decrease of inflow of new customers, declining number of customers and too high taxes (Table 4).

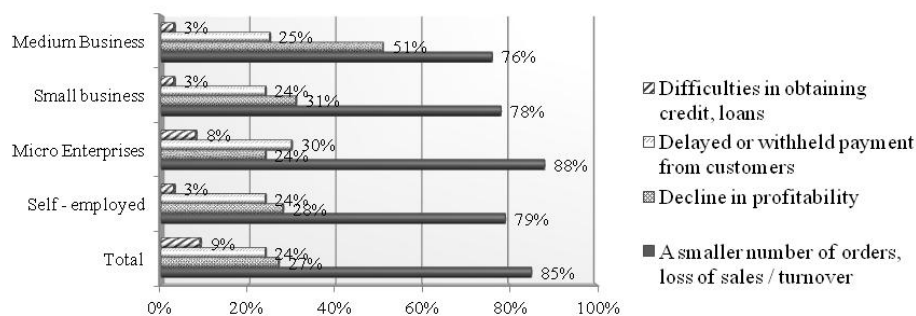


Figure 3. Symptoms of the negative impact of the crisis on the functioning of the company (including companies declaring their situation worsened)

Source: The investment processes and strategies of companies during the crisis, PARP, Warszawa 2010.

Table 4. Main threats to the functioning of the company (% of responses)

	Total	Self-employed	Micro enterprises	Small business	Medium business
The tax system, taxes too high	44%	40%	44%	39%	40%
No influx of new customers, declining number of	43%	34%	44%	32%	32%
The unpredictability of the market, changing economic conditions	37%	29%	36%	36%	38%
Unfair competition	36%	40%	31%	29%	30%
Generally strong, excessive competition	35%	35%	33%	29%	33%
Delay or suspension of payments by customers	19%	16%	21%	20%	26%
Instability of legal regulations	18%	14%	22%	22%	29%
Difficulties in obtaining credit	9%	5%	7%	4%	6%
Unstable exchange rates	6%	3%	7%	7%	12%

Source: The investment processes and strategies of companies during the crisis, PARP, Warszawa 2010.

Much of the enterprises recognizes threat posed by the unpredictability of market and economic fluctuations. The following relationship is noticeable: the larger the company is, the more common is perception of economic instability as a real threat. A major threat to functioning of companies in the SME sector is also competition from other companies and unfair competition (35 and 36% of responses). According to research conducted by the Ministry of Economy companies especially feel the competitive pressure of other small businesses, but rarely indicate a competition of large companies (Enterprise in Poland, 2010).

In response to the crisis, most companies in the SME sector has taken steps to reduce its effects. The results of the report confirms that primary method of dealing with crisis adopted by

companies from the SME sector was to reduce costs in all areas of business, and making savings (Figure 4). This was the main strategy for small and medium - sized enterprises in response to financial crisis (nearly 50% of responses). Reducing costs and increasing savings was reflected in the reduction of employment, changing forms of employment and freezing the level of salaries. During the financial crisis relatively few companies in the SME sector has taken active measures by looking for new customers and markets. In the entire SME sector, one third of the entrepreneur has not taken and planned to take any action in connection with the crisis.

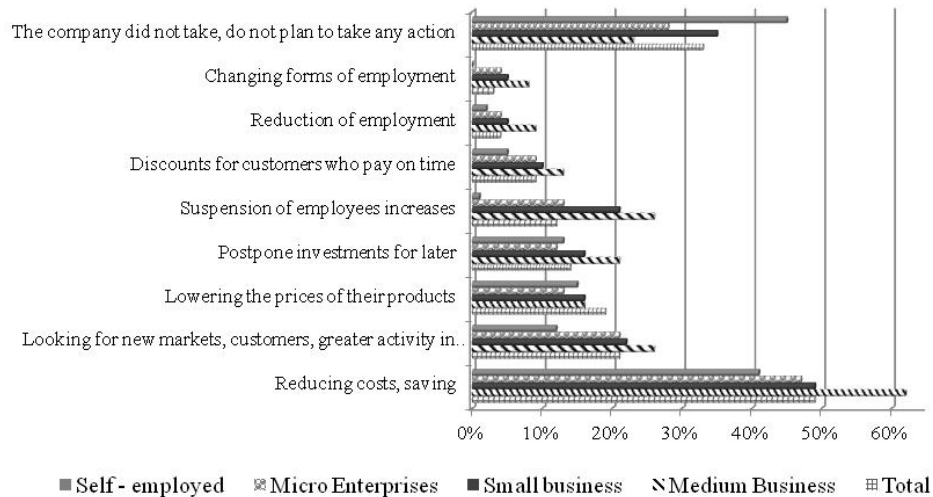


Figure 4. Take on an activity by MSE sector in the financial crisis

Source: The investment processes and strategies of companies during the crisis, PARP, Warszawa 2010.

The conducted research shows that nearly 50% of entrepreneurs from the SME sector admit that the current crisis is a good opportunity to look for new development opportunities. The crisis for much of these companies means new challenges and necessity to reorganize and look for new ways to reach consumers. The report also presented the answer to the question whether Polish companies from the SME sector have been prepared for the crisis (Figure 5). The results are worrying, because 72% of all enterprises in the SME sector had not prepared procedures or contingency plans for dealing with the crisis. In most enterprises the lack of procedures and contingency plans caused these enterprises to choose passive forms of fighting with the crisis, based on primarily on mitigating the negative effects of the crisis, rather than prevention.

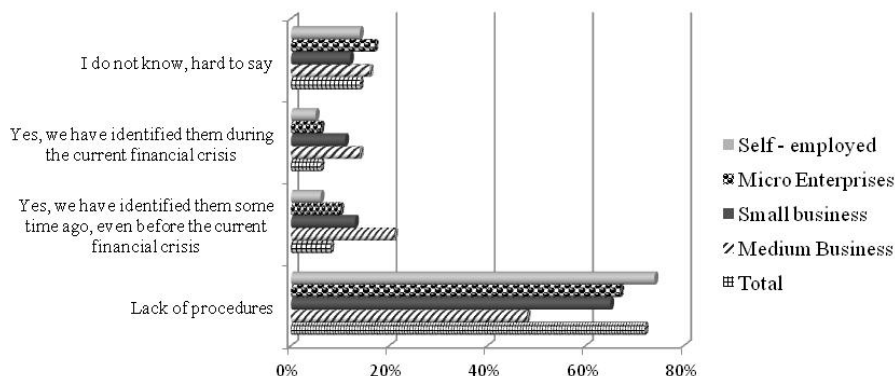


Figure 5. Possess definite procedure or plans for dealing during the crisis

Source: The investment processes and strategies of companies during the crisis, PARP, Warszawa 2010.

CONCLUSION

1. Small and medium sized enterprises are dominant form of business in Poland and the number of entities in the sector is gradually increasing, despite adverse external conditions
2. Condition of the SME sector is highly dependent on GDP and domestic demand, which is determined by the index of social prosperity.
3. Year 2009 was the weakest for the SME sector - it was the only year in which the number of entities deleted from the REGON registry was higher than the newly registered.
4. Huge part of the SME sector has not suffered from the effects of crisis and assess their condition as very good or good (41%), 45% of companies were not fully able to define their situation as either good or bad, which is largely due to local market operations and operators flexibility.
5. Declining levels of consumer spending and, the lack of new customers and high taxes had the greatest impact on the detoration of enterprises.
6. The majority of SMEs did not have and still do not have a strategy for coping with the crisis and usual actions undertaken by entities were cutting costs and reducing expenses (passive strategies).

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Daniel Kvocera, Iveta Paulová¹³

KNOWLEDGE LEVEL OF THE CONCEPT CORPORATE RESPONSIBILITY IN THE FORESTRY AND AGRICULTURAL INDUSTRY IN SLOVAK REPUBLIC

Abstract: This paper informs about research, which was realized by foundation PONTIS in the year 2010. Paper maps knowledge in the area of information about approaches to the responsible enterprise. Results are compared with Slovak average and organization from the area of forestry, wood processing industry and agriculture industry. Information is enhanced from the research realized at the autumn 2010 on the 65 respondents.

Key words: Corporate responsibility, quality improvement, stakeholders, wood industry.

INTRODUCTION

Corporate responsibility (CR) is a relatively new approach of companies towards so – called stakeholders, groups that a firm influence or are influenced by, but it already belongs to the hottest issues of these days, CR has become an issue naturally. It would be useless to blame managers of late decades for mass marketing that have caused plenty of problems: company first - employees and customers second, work first - private life second, production first - watching after environment is waste of time, etc. Five years of war left people around the world in poverty and depression. The mass production was just the result of having nothing. People wanted to forget the war conditions, so greediness, consumerism and materialism took place. But trends and needs of people are changing, and the concept of CR represents new consciousness based on knowledge and effectiveness.

EVOLUTION OF CR

Corporate Responsibility, Corporate or Business Responsibility, Corporate Citizenship, Corporate Governance, Community Relations, Business Ethics, Sustainable Development – these all are expressions that cover the way of leading a business in a responsible way. The prime aim of business is to make a profit. Additional feature, represented by *responsibility*, involves also the social and the environmental element. Together, the CR concept interconnects three categories known as triple – bottom – line. 3 Ps. People, Planet, Profit.

The European Commission defines CR as „a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis”.

„Corporate Responsibility (CR) aligns business operations with social values. CR integrates the interests of stakeholders—all of those affected by a company's conduct—into the company's business policies and actions. CR focuses on the social, environmental, and financial success of a company—the triple bottom line, with the goal being to positively impact society while achieving business success”, CR wire, the world's number one resource for corporate social responsibility news.

European leaders have realised that Europe is grappling with new issues: globalisation, demographic shifts, climate change, the need for sustainable energy sources and new security threats. The result of negotiations between EU member countries in an intergovernmental conference, in which the Commission and Parliament were also involved, was the signing of The Treaty of Lisbon on 13 December 2007, now approved by each of the EU's 27 members. The Treaty entered into force on 1 December 2009. "To become the most competitive and dynamic

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knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion" 25 is a strategic goal of the treaty followed also by an European document Green Paper - Promoting a European framework for Corporate Social Responsibility. This Green Paper aims to launch a wide debate on how the European Union could promote corporate social responsibility at the European and international level, in particular on how to make the most of existing experiences, to encourage the development of innovative practices, to bring greater transparency and to increase the reliability of evaluation and validation. It suggests an approach based on the deepening of partnerships in which all participants have an active role to play. The idea of corporate social responsibility is supported by growing number of initiatives like CSR Europe that was founded in 1995 by senior European business leaders in response to an appeal by the European Commission President Jacques Delors. It has since grown into leading European business network for corporate social responsibility with around 75 multinational corporations and 27 national partner organisations as members. CSR Europe is a platform for:

- connecting companies to share best practice on CR,
- innovating new projects between business and stakeholders,
- shaping the modern day business and political agenda on sustainability and competitiveness.

Triple bottom line, abbreviations "TBL" or "3BL", refers to three aspects of business according to corporate social responsibility - People, Planet and Profit – that should lead to sustainable development. Sustainable development is a pattern of resource use that aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for future generations. Brundtland Commission talked about development that "meets the needs of the present without compromising the ability of future generations to meet their own needs." Sustainable development ties together concern for the carrying capacity of natural systems with the social challenges facing humanity. In practical terms, triple bottom line accounting means expanding the traditional reporting framework to take into account ecological and social performance in addition to financial performance.

Earth Cycles Corporation claims that triple bottom line is designed to prevent six main problems. Environmental part deals with pollution and greenhouse gasses. Social sphere fights against poverty and unemployment. Economic impact is formed by capitalism and consumerism. Triple bottom line creates tools that should reduce harm to the ecosystem, impact on the earth's temperature, lack of sources essential for minimum standard of well – being and uncontrolled production (2).

Triple Bottom Line Profit	People	Planet
Corporate Governance	Employment policy (healthcare, safety, education, training)	Ecological production, goods & services (ISO 14 000)
Code of Ethics	Employment of minority and vulnerable groups	Protection of natural resources
Rejection of corruption	Work-life balance	Investment in environmental technologies
Transparency	Equality of genders	Ecological corporate culture (recycling, energy conservation, etc.)
Preservation of intellectual property	Refusal of child labour	
Investor Relations	Human rights	
Supplier Relations	Philanthropy and volunteerism	
Customer Relations		

LEVEL OF KNOWLEDGE OF CONCEPT RESPONSIBLE ENTERPRISE IN THE FORESTRY AND AGRICULTURE INDUSTRY

In the Slovak Republic was realized research, which enquired level of knowledge of concept responsible enterprise. It is detailed analyses from which we select basic information about knowledge in the area of responsible enterprise in the forestry, wood and agriculture industry. Results are compared with Slovak average and enhanced with information from the resarch which was made in the year 2010 on the 65 respondents (1).

In the research which was made the foundation PONTIS (4) was addressed to the 1000 respondents in the different areas of the business environment including forestry, wood and agricultural industry. Mentioned category of companies was assessed in the group. Both researches were realized in the three different areas (environmental, economic, social-ethic). From the pool of the questions we select basic, which provide information about knowledge in the area of responsible business and interesting about opportunity of providing information in this area.

In the article we present only the general results, which inform about basic knowledge, perceiving and knowledge in the area responsible enterprise.

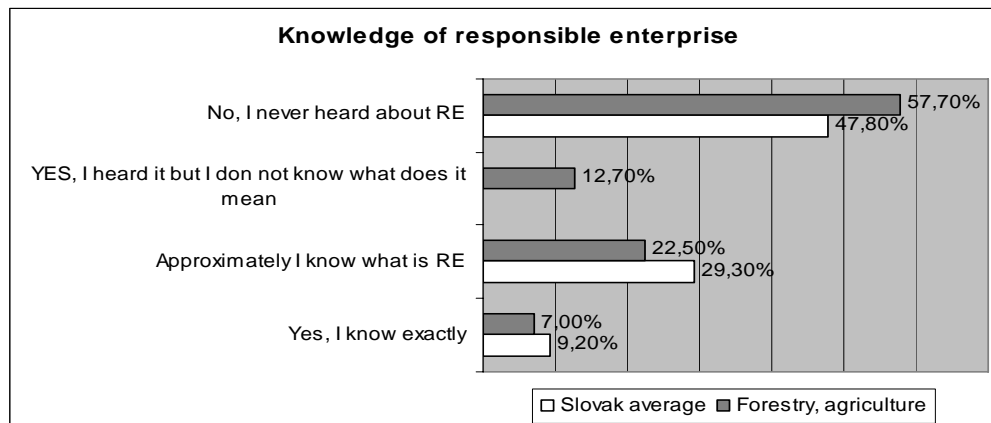


Figure 1. Knowledge of responsible enterprise

From the research results we can say, that from the research group most of the members know what responsible enterprise is. As is known, it is not a new approach in the business environment. It is only complex perceiving of activity management with focus on company environment. From the view of core business of the forestry and wood industry is responsible enterprise obvious and necessary. Management of the company with focus on environmental and economic aspects is based in the legal regulation. In our opinion, the main reason is lack of information from the responsible enterprise.

For responsible enterprise we can asses according the opinion of the research group the company which mainly fulfil requirements of each stakeholder with quality of production and services and putting emphasis on care for the employees. These indicators were highly evaluated mainly in the research and surprising is result form tie foundation PONTIS for organization from the environment of the forestry, wood and agricultural industry. In our opinion is data misrepresented with target group from agricultural industry. Fulfilment of the most important activities and principles is able to realize via the using of quality management, the best approach it will be integrated managerial system or Complex quality management.

The interesting knowledge is also the surveying of the interest for the information about responsible enterprise. Sample of the respondents in the area of the forestry, wood industry and agriculture industry are interested in the information about the responsible enterprise in the form of seminars. This form of sharing information is higher than Slovak average, but in the other hand more than one third of asked parts don not have interest in the sharing of the information about responsible enterprise. Probably it depends on the situation in our national economic.

Presented results from research shown, that organizations have not particular information about knowledge from the area of the responsible enterprise. If we want to fulfil conditions sign in the Lisbon treaty, we have to create properly environment from the side of the government and economic conditions.

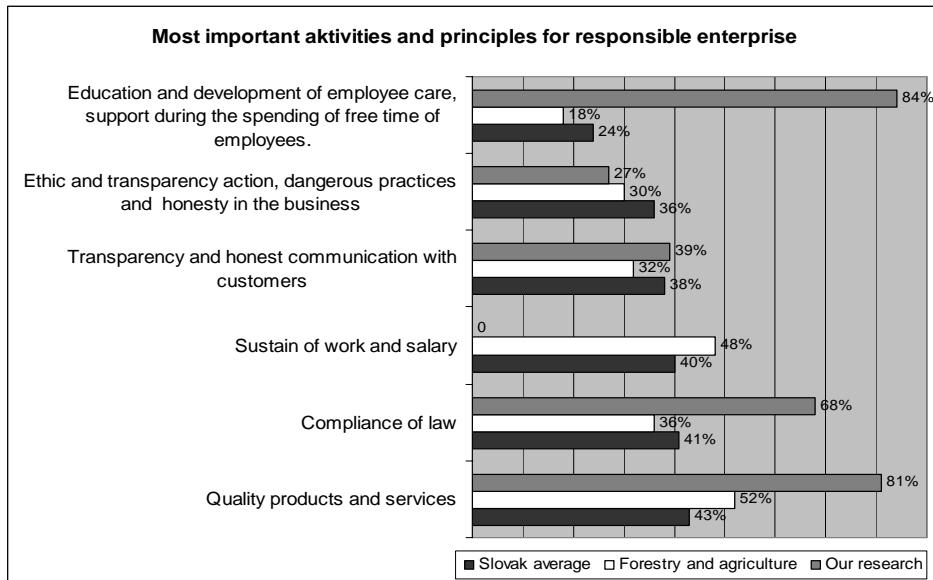


Figure 2. Most important activities and principles for responsible enterprise

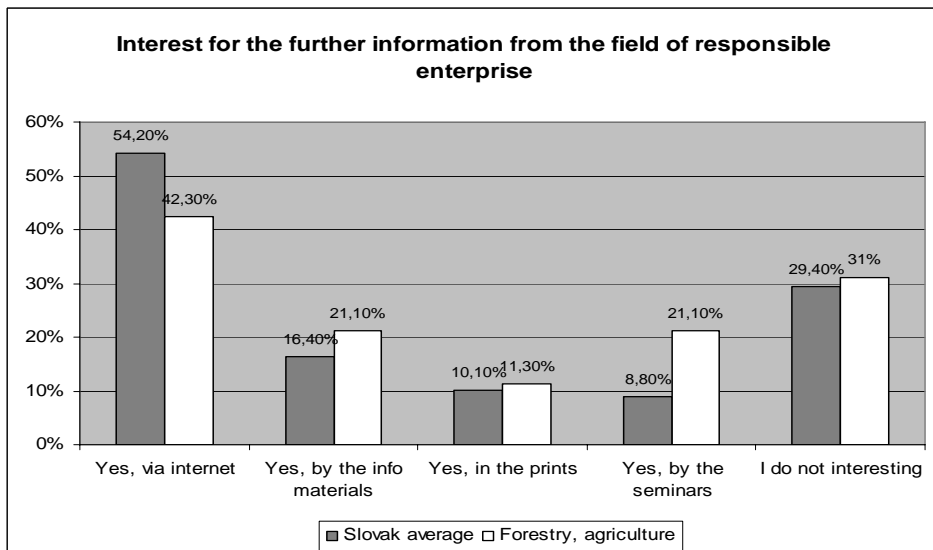


Figure 3. Interest for the further information from the field of responsible enterprise

CONCLUSION

In the end we can say, that responsible enterprise is not the new expression. It is the new approach and statement of the leaders and creation of the conditions for the fulfilment of the each from the free pillars of the responsible enterprise for the satisfaction all stakeholders. Changing approach is similar like philosophy of Total Quality Management (TQM), the primary goal is be able to passing in the business. The huge advantage is realizing of the integrated managerial system,

which consist from the environment, safety and quality. These areas are also part of the responsible enterprise.

For the organization in the wood industry it is easier, because basic aspects are established in the law (mainly in the economic and the environment). From these reason we recommended to the companies focused on the complex company management. The result is competitiveness and success in the open global market. If the company wants to be successful, have to be treating positively by their environment. The responsible enterprise leads to this opinion.

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COMPETITIVENESS OF SLOVAK WOOD PROCESSING INDUSTRY

Abstract: This article deals with wood processing industry and their characteristics in Slovak republic. Firstly, we define the position of WPI in Slovak industry and then we analyze this industry through chosen indicators. Then, we compare competitiveness of this industry via RCA 1, RCA 2 and Michaely index.

Key words: wood processing industry. competitiveness. timber industry. pulp and paper industry. furniture industry.

INTRODUCTION

Wood processing industry has got a vital role in every economy. In recent years, this industry has undergone many problems and its position has been weakened due to adverse events. This paper brings brief description of the wood processing industry in Slovakia via selected indicators.

The classification of Economic Activities, Rev. 2 (2008) puts the wood processing industry into Division 16 - Manufacturing of wood, wood and cork production, except furniture; creation of straw and wicker wares, Division 17 - Production of paper and paper products, and Division 31 - Production of furniture. This segmentation is shown in Table 1. Freelancers and small businesses dominate in the field of wood processing and furniture manufacturing. Large companies deal with the production of pulp and paper.

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Table 1 Classification of wood processing industry according to SK Nace Rev. 2.

Division	Group	
		Section C - Manufacturing
16		Manufacturing of wood, wood and cork production, except furniture; production of straw goods, and basket wares
	16.1	Filing and trimming of wood
	16.2	Manufacturing of wood, cork production, straw processing and wicker wares
17		Production of paper and paper products
	17.1	Manufacturing of pulp, paper and paperboard
	17.2	Manufacturing of paper and paperboard
31		Production of furniture
	31.0	Production of furniture

Source: own processing on the basis on data from the Statistical Bureau of the SR

DISCUSSION

Selected indicators of wood processing industry (WPI)

In the next section, using selected indicators we will analyse the situation in the wood processing industry in Slovakia. We have selected the following indicators for our description:

- the volume of processed wood according to classification of WPI,
- production and consumption of wood products,
- selected economic indicators,
- number of jobs,
- average monthly payment.

We have examined selected indicators from the period 2005 - 2009. Some data from the years 2006 and 2007 were not available.

Table 2. The volume of processed wood in thousand m³ in divisions

Division	2005	2006	2007	2008	2009
Timber industry	5 069	x	4 285	4 491	3 959
Pulp and paper industry	2 302	x	2 333	2 577	2 196
WPI total	7 371	x	6 618	7 068	6 156

Source: Green report 2009, 2010

The greatest volume of processed wood in Slovakia was in the year 2005. Subsequently, this volume decreased in the timber industry. In the pulp and paper industry the volume of processed wood increased, but last year it fell sharply to its lowest level.

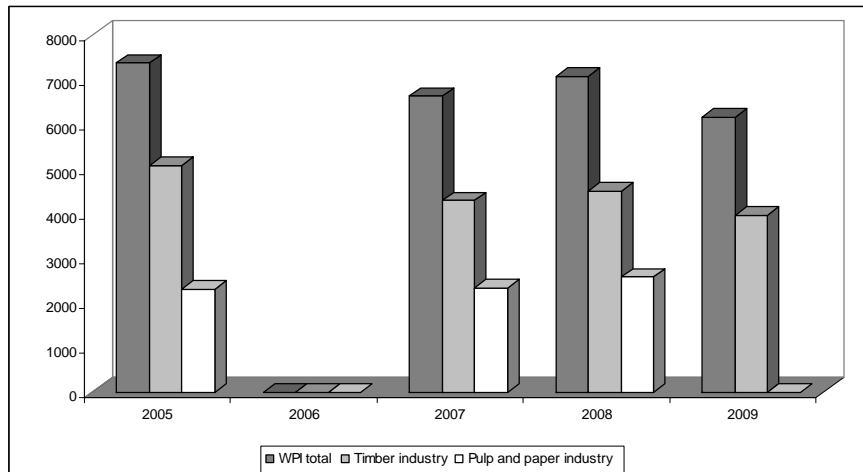
In the field of wood products, we distinguish the following basic groups:

- timber,
- chipboard,
- hardboard,
- cellulose,
- paper and cardboard.

The largest volume of products in m³ per capita is in the field of timber, then chipboard and finally the hardboard. The volume of production and consumption increased in the timber during examined period, together with particle board. Although the production of fibreboard decreased by half, the consumption remained at approximately the same level as in 2005.

In the pulp and paper industry the largest volume in tones per capita has been in paper and paperboard and then cellulose. In this area during the period, an increase was recorded in both product groups.

When comparing the production with consumption, only in case of fibreboard and pulp production, higher consumption than production was monitored in the last year (2008). That means that in these two areas of wood products, we were not self-sufficient.



Graph 1 The volume of processed wood

Source: own processing

Table 3 Production and consumption of wood goods

Range of products		2005	2006	2007	2008
Lumber – production	(in m ³ /capita)	0.487	x	0.515	0.525
Lumber – consumption	(in m ³ /capita)	0.336	x	0.334	0.470
Chipboard – production	(in m ³ /capita)	0.058	x	0.124	0.145
Chipboard – consumption	(in m ³ /capita)	0.061	x	0.124	0.118
Hardboard – production	(in m ³ /capita)	0.050	x	0.027	0.028
Hardboard – consumption	(in m ³ /capita)	0.061	x	0.027	0.053
Cellulose – production	(in tonnes/capita)	0.113	x	0.117	0.128
Cellulose – consumption	(in tonnes/capita)	0.114	x	0.117	0.133
Paper and cardboard – production	(in tonnes/capita)	0.159	x	0.166	0.170
Paper and cardboard – consumption	(in tonnes/capita)	0.094	x	0.098	0.142

Source: Green report 2009, 2010

In 2009 there was a significant decrease in both costs and revenues to the lowest value in the examined period. Despite the decline in the WPI we managed to retain higher yields than the costs and thus produce a profit. The profit in 2009 reached about the same level as in 2005, but compared to 2006 and 2008 it was significantly lower. The highest profit with an increasing tendency was in the furniture industry. On the contrary, the loss was recorded in the timber industry where the profit before tax decreased. The highest yields and the costs have pulp and paper industries as they are challenging industries to finance and invest.

The number of employees in the wood processing industry in the years 2005 - 2008 remained at the same level, but in 2009 this number significantly decreased. This was caused by particularly significant layoffs in the furniture industry, in which until 2009 there was recorded an increase of employees. The average monthly wage in 2009 in WPI was around € 612, which represents a value below the average monthly wage in Slovakia (€ 744.50).



Table 4 Development of economic results of WPI in € mil.

		2005	2006	2007	2008	2009
Yields	TI	662	737	x	681	440
	FI	1 095	1 084	x	956	702
	PPI	1 505	1 544	x	1 646	1 358
	WPI	3 262	3 364	x	3 283	2 500
Costs	TI	636	724	x	671	467
	FI	1 044	1 022	x	905	618
	PPI	1 448	1 464	x	1 533	1 280
	WPI	3 128	3 210	x	3 110	2 365
Economic result before tax	TI	26	13	x	9	-27
	FI	52	61	x	51	84
	PPI	57	80	x	113	78
	WPI	134	154	x	173	135

Source: Green report 2009, 2010

Explanation: TI – timber industry, FI – furniture industry, PPI – pulp and paper industry, WPI - wood processing industry

Table 5 Number of employees and average wages in WPI

		2005	2006	2007	2008	2009
Number of jobs	TI	9 924	9 778	x	8 617	6 250
	FI	11 830	12 144	x	13 242	10 644
	PPI	7 458	7 371	x	7 409	6 876
	WPI	29 212	29 293	x	29 268	23 770
Average monthly payment in €		572	613	x	632	612

Source: Green report 2009, 2010

Products from groups 1610 - 1629 belong to the timber industry. All products in this group except for 1621 veneer and wood-based panels are produced with a competitive advantage. This means these areas are crucial for export in terms of timber industry. The biggest competitive advantage in 2009 was in 1622 Assembled parquet floors measured by an index of RCA 1, RCA 2 and Michaely index. Slovakia has the best position in this area of wood products in the market in the area of export.

Cellulose and paper products are in groups 1711 - 1729. Pulp, paper and corrugated cardboard and other goods from paper and paperboard production reached negative indices in 2008 and 2009 according to analyses, which shows their comparative disadvantage in foreign trade. In contrast, the paper and cardboard, office paper and paper for household use are produced with comparative advantage and in these products the cellulose and paper industry is advantageous in foreign trade. Therefore, the export should focus particularly on those product groups.

Manufacture of furniture belongs to area 3100 – 3109. The whole furniture industry as shown in 2008 and 2009, reached the positive value of the index of competitiveness. The highest index values were obtained in the 3102 kitchen furniture, where we produced the highly competitive products.

Table 6 Development of RCA 1, RCA 2 and Michaely's index in the year 2008 and 2009

	RCA 1		RCA 2		Michaely's index	
	2008	2009	2008	2009	2008	2009
1610 Wood sawn and planed	1.1745	0.7952	0.5224	0.3882	0.003550	0.002804
1621 Veneer sheets and wood panels	-0.1492	-0.3907	-0.0820	-0.1813	-0.000603	-0.001299
1622 Assembled parquet floors	1.3042	1.6253	0.5679	0.6776	0.000338	0.000500
1623 Other goods of carpentry	0.6428	1.1708	0.3039	0.5352	0.001104	0.002645
1624 Wooden containers	0.4590	0.5086	0.2183	0.2602	0.000414	0.000389
1629 Other article from wood, cork, straw and wicker materials	0.2847	0.7995	0.1339	0.3900	0.000163	0.000852
1711 Cellulose	-0.4901	-0.4525	-0.2474	-0.2110	-0.000733	-0.000659
1712 Paper and paperboard	0.5418	0.5091	0.2574	0.2605	0.005181	0.005078
1721 Corrugated paper and paperboard, paper and paperboard	-0.7811	-0.9070	-0.3784	-0.4149	-0.001513	-0.001795
1722 Paper for use in household and toilet articles	1.1157	1.1397	0.5007	0.5241	0.004405	0.005303
1723 Stationery paper	0.1779	0.2490	0.0812	0.1357	0.000076	0.000157
1729 Other articles of paper and paperboard	-1.0396	-1.1243	-0.4834	-0.5006	-0.000713	-0.000911
3100 Seats and their parts, parts of furniture	0.1757	0.3781	0.0801	0.1984	0.001336	0.003320
3101 Office furniture and furniture for shops	0.8174	0.5189	0.3809	0.2650	0.000574	0.000439
3102 Kitchen Furniture	1.6690	0.8498	0.6788	0.4111	0.001040	0.000648
3109 Other furniture	0.6873	0.7208	0.3239	0.3562	0.002455	0.002632

Source: own calculation

Based on analyzed indices data, we can see that the products manufactured in groups 1621 - Veneer sheets and wood panels, 1711 - Cellulose, 1721 - Corrugated paper and paperboard and 1729 - Other articles of paper and paperboard are produced with a comparative disadvantage.

This comparative disadvantage in export is not caused by high labour costs or processed materials, because it would be reflected also in other groups of the wood processing industry. This disadvantage is, in our opinion, and based on achieved results caused due to lack of innovation and insufficient technology used. As the technologies are obsolete and produced uncompetitive products, it is necessary to consider their modernization.

CONCLUSION

Totally we can say, that wood processing industry in Slovak republic is divide into three parts; timber, furniture and pulp and paper industry. All these parts are competitiveness in the foreign markets. Of course, there are some exceptions, but the whole performance of this industry is very good. There are some aspects, where improvement can be done.

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Statistical Office of the Slovak Republic



Wojciech Lis, Marek Tabert, Elżbieta Mikołajczak¹⁵

DEMAND FOR WOOD IN ENERGY PRODUCTION

Abstract: A final energy consumption by sectors of Polish economy within the last 15 years has been presented. Intolerable for natural environment growing energy consumption is the cause of abrupt climatic changes on earth. Rapidly mounting concentration of greenhouse gases in the atmosphere leads to ever more numerous and dangerous natural disasters: draughts, torrential rains, floods, earthquakes and impetuous winds. They bring along enormous destruction on every continent.

Wood, following its technological, structural and usable functions, may constitute energy source of small emissiveness. Also its by-products, useless for mechanical and chemical processing including those produced especially for heating purposes such as briquettes and pellet, should be used as fuels, first in households and subsequently in energy sector.

Key words: energy, wood, emission

INTRODUCTION

Shrinking energy resources, growing, along with civilization development, energy consumption in all its forms, cause a systematic and rapid increase in prices of all energy sources.

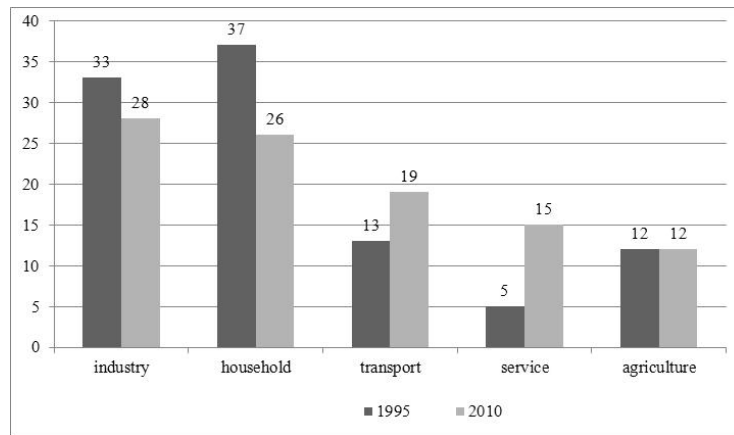
Growing energy consumption is reflected by environment destruction – air, soil and water. Gas emissions are to a large extent the cause of changing climate and weather phenomena so far treated as climatic aberration. Inconvenient for both economy and people phenomena are the reasons for seeking such sources of primary energy which limit their negative effect on natural environment and which, at the same time, do not run out due to their systematic exploitation. They have been called renewable energy sources – RES or sources of “green” energy.

Among those green solutions a leading role is played by units using biomass. The most accessible in large, concentrated volume and due to that the most widely used source of biomass is wood. Wood in its various forms of waste wood, chips, sawdust and specifically produced pellet or briquettes.

Final energy consumption in economy sectors

In picture 1 final energy consumption in selected economy sectors between 1995 and 2010 has been presented. Current energy consumption in those sectors may be shown in descending sequence: industry, households, transport, services and agriculture. From the analysis of a curve in picture 1 it may be concluded that the consumption shift visibly from households and industry to services and transport. Agriculture stays neutral, as farmers primary energy consumption in the period of 15 years under the study did not change. Industry is relatively larger energy consumer than in 1995 and it visibly outstrip households. The highest increase, in the analyzed period has been noted by services as final energy consumption there almost tripled as this sector developed the most. To some extent it proves the thesis regarding post-industrial era in world development.

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Picture 1. Final energy consumption in selected economy sectors in 1995 and 2010

source: own elaboration – data: Central Statistical Office, Energy Regulatory Office

ENERGY CONSUMPTION, CLIMATIC CHANGES AND NATURAL DISASTERS

Growing energy consumption not only reduces its accessibility, exhausts its known and explored sources, increases its costs but most of all it causes excessive emission of so called greenhouse gases – CO₂, SO_x, NO_x etc. As it is believed those gases are responsible for significant climatic changes on our globe, ever more frequent and dangerous natural disasters: draughts, torrential rains, floods, earthquakes and destruction of large areas, sudden violent winds, phenomena causing massive destruction: tornados on land and tsunami at the sea.

Estimates of German insurance company Munich Re show that due to unprecedented concentration of severe disasters 2011 by its half may be considered the most costly in the history – losses amounted to almost 265 billion dollars. Before the biggest damages were caused by natural disasters in 2005 – it was 220 billion dollars yet throughout the whole year.

During the first 6 months of 2011 there were 355 natural disasters. The biggest damage was caused by 9.0 magnitude earthquake from the 11th of March 2011 – the largest Japanese earthquake that ever happened combined with tsunami. This largest natural disaster in history was estimated to cost 210 billion dollars. The former most expensive natural disaster was hurricane Katrina in 2005. It caused damages estimated to be worth 125 billion dollars, the largest ever in south-east states of the USA.

By the end of June 2011 high damages were also caused by earthquake in New Zealand on the 22nd of February, numerous tornados over the south and central-west parts of the USA in April and May as well as flooding and cyclone over an Australian State of Queensland at the beginning of the year.

Catastrophes and natural calamities: hurricanes, earthquakes, floods, volcanic eruptions, draughts will become ever more frequent. By 2050 they may affect 1,5 billion people especially those in large cities.

Losses caused by cataclysms will also become larger, as economic development causes higher concentration of people and material goods on relatively small areas and as the result of civilization development and growing affluence people have ever more goods to lose.

WOOD AND RENEWABLE ENERGY SOURCES

Intensive afforestation of coastal areas is recommended. Forests may protect against tsunami waves, they decrease floods and prevent landslides. Following the period of growth they will also guarantee wood, including parts of it in various periods of wood growth and its usage, for energy purposes.



From the point of view of limiting emissions of CO₂ which is currently under the strictest supervision of ecological organizations and under the most restricted natural environment regulations – the use of renewable energy sources (RES) is widely recommended. Among renewables the biggest practical significance comes from using biomass as the source of heat and energy. Among the sources of biomass which are widely accessible and appear in the form which is relatively convenient for practical usage there is wood of various form and shape. Those are specifically prepared for energy purposes: pieces of splint timber and chips, there is wood waste from mechanical processing- slabs, sawdust or generated during chemical processing paper powder or briquettes and pellet produced specifically for energy generation.

Usage of lignified parts of plants for energy purposes has been going on for a long time, to be precise, from the beginning of human history.

It may be assumed that human history is approximately 5 million years long. Homo Sapiens, the species to which all people currently living on earth belong, appeared in Africa about 200 thousand years ago and has not changed much since then. Yet problems characteristic for farming have remained valid for about 10 thousand years that is from New Stone Age. (Before it there was Palaeolithic Era which embraced approximately 2 million years) For 4 990 thousand years, that is about 99,8% of human history, human existence was based on hunting, fishing and gathering. Other professions did not exist at the time.

After exhausting all animals, fish, and plants in one area people moved onto another location which offered sufficient supply of all resources especially food.

Migrations in general usually meant smaller distances. Some people however wanted to go further, they were looking for something new, wanted to discover, learn and explore. They were attracted by far and unknown places. The bravest ones and the most resourceful and keen to get to know the world went the furthest. After thousands of years they left Africa, gradually settling on other continents.

Millennia had passed and man refined the art of hunting, fishing and gathering. He also noticed that there were places and regions in the world where one does not have to migrate far ahead every day to be able to survive. In those places food was not only available throughout the year but it was also rather diverse. Such places were naturally located nearby river banks and lakes, especially large ones with watersheds, cataracts, river bends, bays etc. In those places miscellaneous, often specific ecological niches were created offering a large variety of plants and animals.

During New Stone Age humans gradually started to interfere with nature, farming and breeding animals, becoming a farmers and thus changing their lifestyle. Instead of migrating often they started to live in one place. First settlements were created.

Among those migrants who left Africa there was one whose genes have been preserved till today. He is currently considered to be a forefather of all non-Africans (geneticists indicated kinship with him using so called genetic marker M168 – small mutation which appeared some 50 thousand years ago). The descendants of that migrant gradually populated the whole world outside of Africa.

Some migrants went east towards Asia and further to America and Australia. Some remained at Near East from there they moved to Asia Minor and then to Balkans and Central and Eastern Europe.

Those emigrating from Africa similarly to their fathers first hunted and gathered the fruits of nature and later they started breeding animals followed by cultivating soil. Gradually, from shepherds they changed into farmers. Later they settled and established first towns. One of the oldest existing continuously for over 3 thousand years is Syrian Damascus. First signs of settlement come from the third millennia B.C. and at the end of the second and third millennia B.C. Damascus was a capital of an independent Aramaean state.

Following the popularization of farming as people no longer had to set off for everyday hunting, they started to take up other activities. Gradually they began preserving food. Later they

started preparing food in more versatile forms through cooking, baking and frying. They created civilization. They also started, on a large scale, to change nature to which they previously had to humbly adjust. Since then economic problems began. Their quintessence are contemporary problems linked to rapidly changing natural environment including the emissions of greenhouse gases.

For centuries wood was used to produce simple tools, light, heat food and then households. The situation prevailed even 250 years ago.

In 18th century using fossil fuels, as wood was not sufficient for activities of such scale, due to numerous and rapid processes of technological, economic, social and cultural changes linked to the shift from economy based on farming to manufacturing (manual production based on segmentation of work done by people specializing in a few simple tasks) or craft activities – industrial revolution took place. It was based on mechanical, repetitive manufacturing of goods in large quantities in factories - those were the beginnings of industrial production.

CONCLUSION

Wood since prehistoric times constituted energy source used for meals preparation, lighting and heating. Gradually technological and industrial solutions significantly limited this role. Currently, ever more commonly, wood is used as the source of biomass also in professional energy sector. Targeting, at all cost, required ratios of renewable energy sources share in total energy balance leads to significant waste of that valuable resource consequently depriving wood industry of its raw material and causing rapid increase in its prices.

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WOOD AND BIOMASS USED FOR ENERGY PURPOSES

Abstract. Wood for burning despite the fact that it is an ecological fuel should be used as fuel only following its practical application as usable wood. Then its supplies will be sufficient for technological purposes, including the production of human friendly goods and building construction. Source of energy should comprise of only that industrial and forest residue which is already useless for mechanical and chemical processing. Part of forest biomass could and should be assigned for energy generation more often than it currently happens. Such activities will

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guarantee the supply of raw material for paper industry simultaneously reducing the adverse results of greenhouse effect what is the conscious aim of burning biomass.

Key words: energy, wood, firewood

INTRODUCTION

Wood constitutes one of the driving forces of Polish economy. Annual export of Polish goods for which production wood was used amounts to 8,4 billion euro. That is almost 12% of the whole of Polish export. Among wooden products a domineering role is taken by furniture. Annually, we sell overseas furniture which is worth over 4,5 billion euro. We are the fourth world-wide and third European producer of interior furnishing outrivaled only by China, Italy and Germany [Lis 2011].

Wood as fuel despite the fact that historically it was the first and used forever should be used only following its practical applications, beyond its technological validity or after ceasing its durability functions.

WOOD AND ARBOMASS FOR HEATING

In forest economy prior to the wider popularization of fossil fuels which took place already in industrial era and in Poland started only in the twentieth century apart from usable wood, firewood was used commonly and on a large scale.

As time passed mainly because of ecological organizations firewood production was significantly reduced. Ecologists started to claim that the thinnest parts of trees both lignified and green were left in the forests due to the need for enriching forest cover and preventing the reduction of biogenic elements, the most important of them being: calcium, potassium, phosphorus, magnesium and sodium (table 1) [Gornowicz 2008]. Additionally, towards the end of the twentieth century and now Polish countryside received and still receives substantial and fully sufficient for satisfying all needs supply of fossil fuels in a form of reasonably priced coal. It significantly reduces labour-intensive and less efficient dead wood gathering in the nearby forests.

From the beginning of the twenty-first century ecologists appeal for usage of forest arbomass for energy generation due to the need for overcoming global warming effects. It is therefore the return to the situation prior to industrial development and in Poland the beginning of the twentieth century.

Wood burning gives highly deceptive reduction in the emission of carbon dioxide (and other greenhouse gases) to the atmosphere. As the result of usage of wood for this purpose greenhouse gases very quickly return to the atmosphere. Their rotation cycle is very short.

Table 1. The content of mineral elements and their loss due to burning of post-cutting residue

Age of trees	Mineral element					
	Phosphorus	Potassium	Calcium	Nitrogen	Magnesium	
	P	K	Ca	N	Mg	
Years	The soil in the mineral elements [kg/ha]					
23	208	118	19	1830	27	
95	227	212	147	3390	90	
Difference [%]	9,13	79,66	673,68	85,25	233,33	
Losses of biogenic elements in combustion the post-cutting residues						
[kg/ha]	9,4	24,7	51,3	67,8	4,92	
%	23	4,52	20,93	270,00	3,70	18,22
	95	4,14	11,65	34,90	2,00	5,47
	change	0,38	9,28	235,10	1,70	12,76

source: own elaboration – data: Gornowicz 2002, Gornowicz 2008, Wojtkowiak 2000, Jodłowski 2010

WOOD AS A „STOREHOUSE” OF CARBON DIOXIDE

Long-lasting usage of wood in products especially in those used by wooden constructions should be a priority. Wooden building may be used for dozens or even sometimes hundreds of years. This way there is a chance of preserving carbon dioxide for much longer than the growth of tree till its rotation age.

The minimum age of trees of various types assigned for cutting is regulated by the Directive of the Minister of Environment from the 20th of December 2005 concerning the conditions and mode of forest planning and simplified planning as well as forest inventory (Journal of Laws 2005, number 256, position. 2151). It has been in force as of the 1st of January 2006. In article 8, paragraph 3 point 1 letter a of that legal act – the minimum age of rotation has been determined for industry-wise important kinds of trees:

- 120 years – oak, ash, elm,
- 100 years – beech, fir,
- 80 years – pine, spruce, larch, douglas fir, maple,
- 60 years – birch, hornbeam, black alder,
- 40 years – aspen,
- 30 years – poplar grey alder.

Assuming that biomass burning gives a zero balance in respect to emissions and carbon dioxide absorption (the same amount of CO₂ will reach atmosphere following burning as it was accumulated throughout several decades of tree vegetation process) – from the moment of burning in a few dozens of seconds a tree which is several decades old till the moment it is reproduced by nature and reaches its rotation age several decades have to pass again. Wood for oak house has to grow for at least 120 years and for larch house 80 years.

Only long-lasting wood exploitation in products (for example in a wooden house, used for long furniture or long-standing maintenance of woodwork etc.) will store CO₂ efficiently.

ENERGY INTENSITY OF MATERIALS USED IN CONSTRUCTION

The production of non-wood goods used for construction and other economic applications is very energy intensive. It is assumed that each cubic metre of used wood instead of other materials results in the reduction of CO₂ emission to atmosphere by on average 0,8 tonne [Rykowski 2008]. Assuming that:

- wooden house reduces carbon dioxide by about 10 tonnes,
- 10% increase in the share of wooden construction on European market may limit CO₂ emission to atmosphere by 1,8 million tonnes,
- each 10 wooden windows will reduce CO₂ emission by 4 tonnes in comparison with aluminium windows and by half a tonne when compared with PVC windows.

Energy intensiveness of the production of materials universally used in construction (such as cement, aluminium or steel) is many times higher than wood and causes larger share of emissions of harmful gases among them CO₂ to the atmosphere.

Assuming that growing tree and obtaining wood from it, processing of that material and integrating wooden elements with ready-made products requires one energy unit for the following materials one would need [Rykowski 2008]:

- 4 units – for cement,
- 6 units – for synthetic materials (for example: PCV),
- 126 units - for aluminium,
- 244 units – for steel.

WOOD AND ENVIRONMENT PROTECTION

Wood deficit in Poland, which grows significantly whenever economic situation improves is not only the result of the dynamic production and export development of wood and pulp and paper sectors caused by price competition on European markets and favourable currency rates. Serious if

not causative for deepening of this situation is growing wood usage as source of energy which is fully renewable, environmental: that is fulfilling the standards of environment protection, as well as very economic material. Additionally this source is most easily accessible at a large scale facilitating its profitable technological usage including commercial energy sector and heating.

Shortage of wood with no doubt is deepened by its intensive usage by electric power plants in the process of co-burning with coal, what in a sense is the result of ecological contracts and very ambitious requirements imposed by the European Union.

Embraced by burning process or at least considered to belong to renewable energy sources should be only that wood which already fulfilled its usable and durability functions and wood residue which is already useless for technological processing by wood and pulp and paper industry sectors.

High price of green energy in Poland influences the deterioration of competitiveness of the whole of Polish economy. Beneficial ecological effects may be obtained faster and cheaper via installation of modern filters in conventional electricity power plants.

The urge to reach RES energy ratios in accordance with EU regulations and Polish gradually more restrictive directives of Minister of Economy on that matter has to deepened wood deficit and difficulties in supplying wood and pulp and paper industries if wood still remains the most significant source of biomass and the fundament of RES operations. Practically unlimited demand for wood of energy sector causes, at least at times of prosperity in Europe and Poland, exceptionally easy opportunity of selling round wood of any quality and quantity. Wood price is easily transferred onto energy recipients.

CONCLUSION

Determining priorities of round wood usage, natural and rather obvious seems to be the approach which first assigns wood for the production of highly processed goods. In wood chain adequate direction of satisfying demands starts from veneer wood and hulling wood through sawmill wood including especially wood used for construction of wooden houses, wood for packaging (including pallets) and for the production of garden architecture followed by wood for panels production, for pulp and paper industry and further for households and the production of briquettes and pellet.

Commercial energy targets should be placed at the very end of that chain of round wood and wood waste supply. To satisfy its needs the remaining part of wood should be assigned for its use that is residue of low value from mechanical and chemical processing, as well as branch wood, wood from field and road trimmings and orchards maintenance. It requires developed logistic operations from energy sector.

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INCREASE OF ECONOMIC EFFECTIVENESS USING FACTORING

Abstract: Increasing the economic effectiveness contribute for process improvements in the companies, to productivity growth, competitiveness and to better situation of existing company on the market. This scientific article treats with the economic effectiveness, because in today's high competitive in every business sphere, it is crucial to produce more effective than others. The text is oriented only on the two main themes, the economic effectiveness and the factoring which increase economic effectiveness.

Key words: economic effectiveness, technological effectiveness, factoring

INTRODUCTION

Competitiveness in world trade in this time of globalization influence goods and services get to the ending users. In the face of increasing competition, manufacturing companies have to consider new methods of increasing the value of their products. Nowadays conditions, trade of "buyers", the sellers is due to competition forced to offer their business partners longer term of payment of receivables. The risk of non-payment of receivables stays on the side of sellers. They are tied down by financial funds and it slows down their turn-over. Most sellers are therefore forced to solve their requirement on liquidity and elimination of risk appropriate to financing. In this contribution I will dedicate this time in explaining the factoring financing by connection of existing availability of financial business operation with information and communication technologies, we can accomplish further benefits for all attending sides. Improved economic effectiveness too with factoring to reduce costs and higher product specification to raise levels of quality are needed to maintain existing business. [2]

To implement the strategic vision (take advantage of strategic opportunities and address problems) manufacturing companies have to implement changes to their business processes, products, and/or to the organization itself. Maximising productivity and the effectiveness of operations through innovations are the key element of companies' strategic plans and is a key concern for business managers in every industry. Analyses of industrial practices over the last decade show that the quality, functionality, and schedule availability of products and systems all improve significantly with the increasing relevance and effectiveness of the processes indigenous to a company's management, engineering and manufacturing organizations. [7]

Corporation improvement is subjected to the growth of its effectiveness, during which time it is possible to observe, that manufacturing corporation effectiveness is directly proportional to their economic effectiveness. In case that corporation wants to achieve high economic effectiveness, it has to optimally exploit the existing resources of production factors. By force of production planning the corporation analyses the possible hazards and deduces the knowledge for the behaviour. Nowadays, small and medium enterprises play a key role in national economy. [5]

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ECONOMIC EFFECTIVENESS IN TODAY'S COMPETITIVE ENVIRONMENT

Economic effectiveness represents the achievement of maximal outputs at given sources, which are used by the realization of given activity. Measuring the effectiveness of production represents the valuation of relationship between the results, which are formed by the given production and the inputs that are consumed. [1] The effective production is that, which produces the maximum outputs by the given inputs, or which forms certain level of outputs by the minimal level of inputs.

Application of the term effectiveness in various context causes, that it practically gets heterogeneous character. Effectiveness could be understood as a successful manufacturing activity, use of a new technology or work organization, decrease of the rate of production usage and total costs, increase of the side-run, uniformity of production and products quality, elimination of work difficulty and raising workers performance etc. So effectiveness reflects the new qualitative elements in the manufacturing activities, eventually in other parts of reproduction process. Effectiveness could be understood as the ratio of achieved results and amount incurred, and this ratio should be maximised. It means to achieve the maximum or optimal results with minimum or optimal resources. In general effectiveness could be understood as the optimal utilisation of sources, means and human work results by exploiting laws of nature, society and thinking in achievement of socially useful goals.

The level of effectiveness reflects quantitative and qualitative rate of conformity of goals (estimated on the base of knowledge and objective socio-economic laws) and resources necessary for their achievement.

Economic theory is using various terms of effectiveness [1]:

- social effectiveness – reflects effectiveness of given social system in compare with former system, as well as effectiveness of currently developing economic systems,
- technical effectiveness – consist in exploitation and transformation of natural forces and material to the human applicable forms,
- economic effectiveness – is based on use of social laws (especially economic) for universal development of economy.

Effectiveness as a fundamental category is internally own to any mode of production. In all of the socio-economic formations exists the law of time economy, which reflects the ambition to achieve maximum results with investing minimum quantity of socially necessary work. Basis of the effectiveness is thus time saving. Effectiveness is influenced also by the production relations, which holds in a given mode of production. Change in the mode of production raise also the change in quality of manufacturing relation and consequently is changed also substance (content) of effectiveness. Each mode of production has thus own substance of effectiveness. This implies special and historic character of effectiveness as an economic category. Historic character of effectiveness is reflected also in change of it content in the frame of given mode of production, in connection with better human knowledge and change of objective conditions of social development.

For investigation or analysis of economic effectiveness is necessary to separate:

- really achieved economic effectiveness – effectiveness ex post,
- planned economic effectiveness – effectiveness ex ante.

Economic effectiveness is a term typically used in microeconomics when discussing product. Production of a unit of good is considered to be economically efficient when that unit of good is produced at the lowest possible cost. Present economics literature gives a useful introduction to the difference between economic effectiveness and technological effectiveness. There are two concepts of effectiveness [6]:

1. Technological effectiveness occurs when it is not possible to increase output without increasing inputs. Technological effectiveness is an engineering matter. Given what is technologically feasible, something can or cannot be done. Technological effectiveness is measured by the ratio of units of output to units of input:



$$\text{Technological effectiveness} = \frac{\text{Units of output}}{\text{Units of input}}$$

2. Economic effectiveness occurs when the cost of producing a given output is as low as possible. Economic effectiveness depends on the prices of the factors of production. Economic effectiveness is defined as the ratio of the value of output to the value of input:

$$\text{Economic effectiveness} = \frac{\text{Value of output}}{\text{Value of input}} = \frac{(\text{Price of output}) \times (\text{Units of output})}{(\text{Price of input}) \times (\text{Units of input})}$$

Something that is technologically efficient may not be economically efficient. But something that is economically efficient is always technologically efficient. A key point to understand is the idea that economic effectiveness occurs "when the cost of producing a given output is as low as possible". There's a hidden assumption here, and that is the assumption that all else being equal. A change that lowers the quality of the good while at the same time lowers the cost of production does not increase economic effectiveness. The concept of economic effectiveness is only relevant when the quality of goods being produced is unchanged.

When the companies want to work on the high production level, they have to distinguish two different effectiveness:

- 1) static effectiveness,
- 2) eco-effectiveness.

Static effectiveness exists at a point in time and focuses on how much output can be produced now from a given stock of resources and whether producers are charging a price to consumers that fairly reflects the cost of the factors of production used to produce a good or a service. There are two main types of static effectiveness:

- a) allocation effectiveness is achieved when the value consumers place on a good or service (reflected in the price they are willing to pay) equals the cost of the resources used up in production. Condition required is that price = marginal cost. When this condition is satisfied, total economic welfare is maximized,
- b) production effectiveness refers to a company's costs of production and can be applied both to the short and long run. It is achieved when the output is produced at minimum average total cost.

Eco-effectiveness of production is an important concept both from the viewpoint of society and business community; but as yet, there is no unambiguous way to its measurement.

When someone wants to consider about manufacturing effectiveness, he has to first understand the term of effectiveness and especially economic effectiveness. Effectiveness is never absolute; it is always relative to some criterion. Economists are interested in economic effectiveness for two reasons:

- 1) positive,
- 2) normative.

The positive reason is based on the observation that people search for value. On the theoretical level, we have seen this search for value in discussing utility maximization and profit maximization. The search for value is the driving force of market (and perhaps most no market) economies. If there are situations in which there is unexploited value, that is, value that is possible but which no one obtains, the economist needs to explain why someone does not find a way to capture this value.

The normative reason stems from a desire to make policy recommendations. It is possible to discuss some aspects of policy without normative assumptions. An economist can predict, for example, whether a policy will or will not achieve the goals set for it.

But economists often want to do more. They often want to compare two policies or two situations and decide which is better. To decide which is better requires some sort of basis for ranking situations. Thus, if they want to ask whether government regulation of utility prices, a tariff on steel, or a program to train unskilled workers helps society, economists need a criterion on which to base their answer. Economists generally use the criterion of economic effectiveness to evaluate situations, though they often supplement it with other considerations because economic



effectiveness is not the only way to judge the relative merits of two situations. The value maximized in the notion of economic effectiveness reflects the goals that people have. The concept of economic effectiveness treats all goals as equally valid; no goals are considered better than other goals.

INCREASE ECONOMIC EFFECTIVENESS WITH FACTORING

Increase economic effectiveness we see in security outputs with alternative financing of factoring. In the world of business there must be clear rules for all joint parties. It means that the seller (if it is maker, importer or exporter) must get paid for the sold goods the right amount and get paid on time. On the other hand buyer (importer) must get the right goods and fill in the contract on time. These rules are contained in the agreements in which they both sign between each other (business partners). In this time the sellers are pushed to give prolonged time of payment buyers, because of the reason of competition. There is a risk that the buyer will not pay on time. Given loan is that it binds the seller's financial resources and it can slow down his turnover.

One of the possibilities of eliminating the risk from the relationship of supplier-buyer is the use of alternatives of financing concrete factoring. Alternative forms of financing offer the supplier "without loan financing" and in this way it proves that it can eliminate the risks of payment of the insolence of the debtor (buyer). Increase economic effectiveness we see in security outputs.

Factoring shows redemption of short-term receivables specialized by financial institution. The client of factoring company is offered advance financing and elimination of risk in case of payment insolvency from side of debtor. Factoring operation is brought to life by supplier-customer relationship. Supplier-customer relationship can happen on national or international scale. At any time the supplier can turn to factoring company.

For factoring company these investments mean the availability of temporary usage of free financial capital. Process of financing operation in relation with financing of engineering firm is:

- 1) seller turns to factoring company with request of cooperation via electronic data exchange – statement of account belonging to web-page of the factoring company;
- 2) in case of favourable view about the supplier, both sides sign factoring agreement with given credit limit, this has revolving character. In the present time both parties can sign the paper by hand or via electronic form;
- 3) seller provides and gives the customer goods or requested service advance financing without credit draws-up an agreement which is provided in the assignment clause that the invoice was sold to factoring company. The Law of accounting number 431/2002 statues at large defines written and technical form of account record;
- 4) transfer of receivable – cession must have on the basis of the Civil Code number 40/1964 statutes at large in written form. It is by law valid in electronic form too if there is electronic signature provided also and verified. Secure electronic signature define Law number 215/2002 statues. At this time is price guaranteed by the electronic secure signature approximately 85 EUR;
- 5) after the sale of receivable, the factoring company fulfils its obligation of advance financing of (60-95%) of receivables in favour of account of supplier;
- 6) in due time of payment the customer pays into account of factoring firm;
- 7) factoring company pays out additional payment of receivables in the interest of account of seller after its reckoning of the factoring companies commission and interests. [8]

In the case of points 5, 6, 7 electronic settlements can be paid via electronic payment for example Internet banking. Alternative financing is interconnected with information technology offers the clients the following benefits. For example:

- reliable and quick transfer of financial information,
- saving of time,
- saving of operating expenses,

- the simplicity, reduction of payment and quick communication between partners in Slovakia and abroad,
- saving of costs of the formation processing and archiving of documents,
- elimination and quick correction of mistakes in business agenda,
- the ability of operative solution of business problems,
- automatic process factoring transaction,
- increase of security and installation of electronic signature,
- bigger transparency and availability of documents,
- ecological view point (saving of paper and petrol).

CONCLUSION

One of the three conditions necessary for an economy to be economically efficient is that it be on its production-possibilities frontier. If it is not on the production-possibilities frontier, more could be produced with the given resources and technology. Because greater production would increase value, any position below the production-possibilities frontier is inefficient. This requirement that resources must be used properly can be stated more technically. Effectiveness requires that an equimarginal principle has to be satisfied. It requires that the ratio of marginal products for any two resources be the same for all products. [4]

Seller – buyer relationship is now based on prolonged time of payment for receivables which come into being to seller, and obligation which the customer has to compensate. If the sellers want to be competitive they are forced to provide their customers a loan, but the loan is tied to financial funds, which the suppliers could use for running a business. Financing of receivables is generally based on simple documentation transaction mostly in the form of buying agreement, invoice, and order. [3] Agreement and invoice guarantees the right of owner of receivables to show in the future real establishment of receivables. The order is important from the point of view of the owner of receivables for the proof of identity that the debtor has really ordered the goods which he in the future could deny. In receivables there is possibilities the control of both the seller and buyer and in the way that, what the supplier recordings should be shown in financial accounts of buyer. Business receivables of supplier after factoring operation goes out from account of supplier, it changes its character into money on account. It quickens turnover of firm and forces buyers to pay on time, because financial companies can put the debtors on international “black list” of non payers. By this that the buyer will be in the database of informational office in the group of non payers, the ending result can also be that these unpunctual buyers will lose their present suppliers and also the suppliers in different countries, or the banks will cancel their loan because they have become risk clients. Factoring offers the suppliers the needed liquidity and also eliminates the risk of payment insolvency. Joint alternative financing with information technology offers the written and other benefits for all parties concerned consequential from electronic communication. Total electronic factoring operation is by Law of Slovak republic possible, but it is not much used. Factoring allows for companies increase economic effectiveness.

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TIMBER INDUSTRY AT THE TIME OF EMERGING FROM ECONOMIC CRISIS ON THE EXAMPLE OF A PRODUCER OF WOODEN HOUSES

Abstract: The effects of world-wide economic crisis are still noticeable in numerous sectors of economy. Information concerning forecast of economic slump or company bankruptcies is still present. The aim of the article is to determine factors which affect enterprises operations, especially those producing wooden houses at the time of emerging from economic crisis, to emphasize problems which the producers encounter at that stage as well as to show development opportunities for timber sector from the perspective of contemporary Europe.

Keywords: wooden constructions, economic crisis, development prospects.

INTRODUCTION

World-wide economic crises which began in the USA in 2007 in its first phase was not visible in Poland. However as the recession grew its results started to be felt also in our country. Events which took place at that time originally related only to capital markets yet within a short time they were also reflected in the scale of problems of the majority of producers, especially those who based their operations on the cooperation with overseas clients. Slump in Euro zone economies which were main trade partners of Poland resulted in the lack of demand for Polish products, especially those from industrial sector. This sector at the end of 2008 and the beginning of 2009 noted significant decrease in sold production from 7,1% in the second quarter of 2008 to 5,1% in the second quarter of 2009.

Another factor which negatively affected Polish economy was a decrease in the value of Polish zloty which resulted in the increase of loans in foreign currencies which led to enormous losses due to earlier transactions of foreign currency options. The effect was presented in negative results of industrial sector at the end of 2008 and the beginning of 2009.

Alarming signals came from the domestic market too, where the limited number of investment and decreased level of consumption became a threat for economic growth. It resulted in

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deteriorating situation on the labour market. Nevertheless, Poland as the only country in Central and Eastern Europe in the first half of 2009 noted GDP increase (Raport... 2009).

SITUATION IN TIMBER SECTOR AT THE TIME OF EMERGING FROM ECONOMIC CRISIS

Despite the fact that out of all countries of Central and Eastern Europe Poland seems to be the least affected by economic crisis still its results are noticeable in Poland, too. Many companies struggle against serious problems which, to a large extent, depend on exchange rate system and the level of cooperation and interconnection with the economies of other members of European Union.

Among the sectors with a significant potential there is, just like in the rest of EU, timber sector. It is strongly linked to the players of the international market and it has an enormous impact on Polish economy. The data of Central Statistical Office shows that Polish timber, paper and furniture sectors employ approximately 270 thousand people which constitutes 13,1% of all people employed by industrial sector in Poland. Such significant employment share is reflected by revenue from sales. (Sektor drzewny 2011).

In table 1 sales revenue and financial results of timber and furniture sectors between 2009 and 2011 have been shown (data concerning 2011 relates to the first quarter of that year). Even though industrial sales revenue within the three years under analysis show growing tendency, in timber sector the situation is a little bit less favourable. In 2010 despite an increase in revenue from sales of timber and timber products the revenue from furniture sales is lower and financial result even though positive shows decreasing tendency. Neither domestic nor international market in current situation is able to guarantee sufficient demand. It is due to the decrease in the interest in new products in unstable financial situation as well as more restricted bank policy which limits access of the potential borrowers to financial resources hence purchasing new flats and as the result new furnishing. Even international economic boom is not able, within a short period of time, compensate for the loss of so far potential clients.

Table 1. Revenues from sales and earnings in million zł

	2009	2010	2011*
Revenues from sales in total industry	935 609,8	1 010 646,5	272 157,9
Financial result	59 333,9	66 790,7	21 468,7
Revenues from sales in wood industry	15 716,0	16 886,1	4 238,1
Financial result	883,5	667,2	202,1
Revenues from sales in furniture industry	23 075,1	21 177,1	6 064,0
Financial result	1 731,2	1 342,4	254,6

* data concerning 2011 relates to the first quarter of that year

Source: own elaboration based on Concise Statistical Yearbook of Poland 2011

In case of timber producers and the producers of timber products better economic situation is the result of broader usage of products and more divers market of recipients of final products.

Among the recipients of timber there are producers of wooden houses. This branch of timber sector plays an ever more significant role in the overall balance of wood processing. Interest in wooden buildings and especially light timber-framed constructions and log houses has its share in the impact of world-wide economic crises on the European market. In the recent years significant slump in the production of wooden houses has been noted and the process of returning to the situation from the time before that crisis and increasing the share of those types of products in building sector will depend on loan accessibility and the prices of raw materials in comparison with traditional forms of construction.

PROBLEMS OF PRODUCERS OF WOODEN HOUSE ON THE EXAMPLE OF HEBAN COMPANY

Numerous enterprises due to bad economic situation and the resulting significant decrease in demand for houses had to limit their production. This decision was also directly conditioned by the increase in prices of raw material. Fig. 1 presents the level of timber prices in Poland and selected European countries. As it is visible from the presented data prices of timber in Poland in comparison with for example Germany or Scandinavia are the highest. In the situation of limited demand for finished products increase in the costs of raw materials further destabilizes sales.

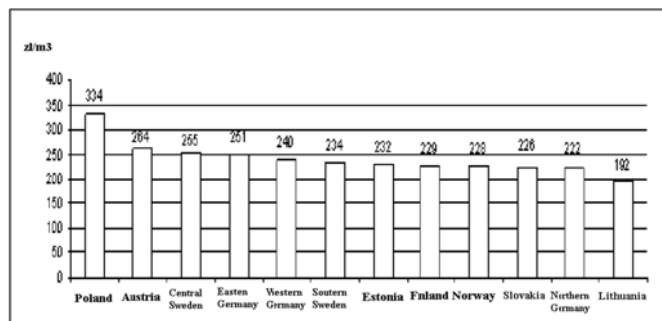


Fig 1. Compare prices of wood in Poland and selected European countries

Source: own elaboration based on data PIGPD

On the basis of data made available by the company producing wooden houses, changes in purchases of raw materials as well as the production between 2007 and 2010 have been determined. Table 2 shows forest districts from where the majority of raw material has been delivered to the company, within the period under analysis. From the obtained data one may conclude that four forest districts supplied the producer with comparable amounts of raw material. In the remaining cases significantly fragmented deliveries and small volume of raw material bought substantially increased the cost of supply as well as hindered planning the whole production process. Due to lower raw material limit and the growth in timber prices as well as an unstable demand for finished products a decrease in the number of project to be realized has taken place.

On the basis of available data also changes taking place between 2008 and 2010 in the sales of company finished products, that is building elements, modules and wooden houses have been determined. Picture 2 presents the share of sales of finished goods produced by Heban company. From the obtained data it is visible that between 2008 and 2010 the majority of sales concerned hotel modules and wooden houses. Despite an increase in interest in wooden buildings within the period under analysis substantial decrease in production was noticeable what is linked to numerous factors among them increase in prices of raw material and limited demand for a specific product such as timber-framed building.

Table 2. Space the acquisition and the amount of raw material delivered in years 2007 – 2010

Lp.	Forestry	2007		2008		2009		2010	
		The amount of raw material [m ³]	Share [%]	The amount of raw material [m ³]	Share [%]	The amount of raw material [m ³]	Share [%]	The amount of raw material [m ³]	Share [%]
1.	Golub-Dobrzyń	1483	4,3	1495,51	3,56	-	-	-	-
2.	Olsztyn	1544	4,5	1596,39	3,80	-	-	-	-
3.	Miradz	1594	4,6	-	-	-	-	-	-
4.	Borne Sulinowo	1630	4,7	1615,65	3,85	2265,02	7,7	1219,18	4,39
5.	Bytów	1687	4,9	1902,11	4,53	-	-	-	-
6.	Dąbrowa	2169	6,3	3179,07	7,57	1195,49	4,0	1825,1	6,56
7.	Stare Jabłonki	2298	6,7	3123,08	7,44	-	-	-	-
8.	Czarne Czluchowskie	3281	9,5	3392,39	8,08	2730,30	9,3	2904,06	10,45
9.	Ilawa	3784	11,0	3758,71	8,95	-	-	-	-
10.	Zamrzemica	3838	11,2	4947,21	11,78	5264,22	17,8	5074,34	18,25
11.	Osie	-	-	1750,95	4,17	1222,94	4,4	1109,36	3,99
12.	Starogard	-	-	-	-	2233,61	7,6	1114,2	4,01
13.	Szczecinek	-	-	-	-	2419,87	8,2	1964,5	7,07
14.	Woziwoda	-	-	-	-	3353,67	11,4	2421,08	8,71
15.	Tuchola	-	-	-	-	1756,98	6,0	-	-
16.	Trzebciny	-	-	-	-	1311,94	5,63	1658,84	5,97
17.	Czarnobór	-	-	-	-	-	-	1384,64	4,98
18.	Other	11071	32,3	15227,79	36,27	16246,0	17,97	7126,26	25,62
TOTAL		34379	100,0	41988	100,0	40000	100,0	27801	100,0

Source: own elaboration based on data company

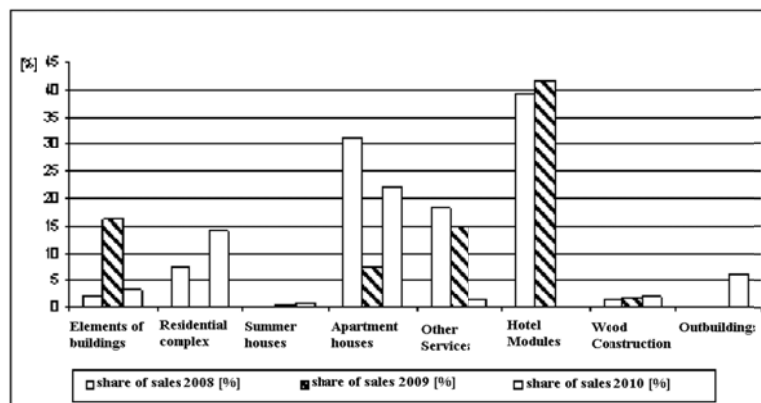


Fig 2. Changes in the share of production of timber structures

Source: own elaboration based on data company

Analyzing sales dynamics significant slump in sales of ready-made products of the company is to be seen in 2009, by approximately 18%, and in 2010 by 50% in relation to 2008. Such situation is the confirmation of a difficult situation on the market of producers of wooden houses.

The share of own and purchased materials used for timber-framed constructions is not to be neglected when analyzing company's financial situation and its finished products. Over the last three years the share of raw material purchased for timber-framed constructions has grown from 0% in 2008, 25% in 2009 up to 60% in 2010, while the share of own production decreased from 100%



in 2008 to 75% in 2009 and 40% in 2010. The changes in the share of own raw material and the purchased one are also the effect of introducing in Poland higher demand concerning using certified construction material, which means significant costs of launching new technologies improving durability checks or searching for the suppliers of such materials. Therefore requirements related to certified materials even though enhance an overall quality in timber construction also significantly increase the price of undertaken project. Due to a limited amount of certified material available on Polish market it is frequently imported and its higher price makes up an additional cost in the calculation of the price of finished product.

ADVANTAGES OF TIMBER SECTOR IN POLAND

Despite numerous difficulties opportunities for further development of timber sector in Poland are still significant. To a large extent they depend on international cooperation. They stem mainly from long-term trading experience of our entrepreneurs with overseas markets. Favourable location of our country and the ability of adjusting production offer to high quality and technological demands of clients constitute Polish unquestionable advantages. For foreign recipients production costs, especially labour costs which are substantially lower in Poland than in other western European countries, constitute a significant factor.

SUMMARY

World-wide economic crises had a significant negative impact on many sectors of economy among them timber sector. In case of finished highly-processed products the decrease in demand from the clients is linked to the loss of trust in producers and the limitations in crediting investments. The return to the situation before the crises in terms of production and sales and the improvement of basic ratios will require economic stabilization in the upcoming years. The increase in prices of raw material in case of National Forests being the main domestic monopolist has a negative effect on timber production and as the result on the situation in timber constructions.

In recent years timber building showed decreasing trend in production. It was related to limiting financial resources and deteriorating credit situation which took place in case of individual investments. Obligations concerning using certified material for timber houses may in the near future have a negative impact on the increase of costs of production followed by decrease in supply.

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PROCES MANAGEMENT AS AN IMPORTANT PART OF MARKETING ACTIVITIES IN THE WOODWORKING INDUSTRY

Abstract: Currently, a great importance is ascribed to the process orientation in quality management. A part of Juran's Quality Spiral involves also marketing, which represents the course of the main activities and supportive processes in the organization. Specific feature of marketing processes is that they focus on market analysis, marketing planning and development of marketing

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strategy within the organization, with the aim to promote sales of product and establish communication with customers. This paper intends to emphasize the importance of positive and negative aspects of process orientation in marketing and better performance of the company in competitive environment.

Key words: quality management, marketing, process orientation, Juran's Quality Spiral

1. INTRODUCTION

The application of process approach is considered an efficient form of improving the management of economic organizations and building effective quality management systems. Process approach represents a form of the management of economic organization, which is much older than ISO standards for quality management systems, which appeared in the first decade of the previous century.

Regardless the formal approach predominating in most of the economic organizations, one of the reasons of insufficient application of the process approach in Slovakia is the fact that there are not enough publications available in Slovak language, which results in considerable simplification of the process approach application in the organisations' management.

Even worse is the situation in the process approach application in quality management systems. The systems were built in compliance with the standards of quality management systems and on the basis of functional approach, where groups of integrated actions were allotted to particular organizational structures of economic organisations, while the output of the sequence of actions was not unambiguously defined, or the outcome was the bare implementation of those actions regardless the final outcome. A purely formal approach to the application of process management is therefore quite frequent in the quality management systems in Slovakia. Such formal approach has been driven by the fact that though ISO quality management systems innovated in 2000 mention the necessity of introducing the process approach to quality management, yet the necessity is accentuated only verbally in the parts of the standards which are not actually binding. This was reflected in the fact that individual documents prepared for quality management systems according to the standards of 1994 based on a functional approach and quality management activities and describing the activities of quality management in the individual elements of this system, were only renamed as written procedures documenting the processes, while the elements of quality management were identified as processes. Practical transition to such a "process approach" thus affected neither organizational structure of, nor the way of quality management.

2. PROCESS-ORIENTED MANAGEMENT

Process-oriented management, usually identified with the concept of "process approach" in ISO standards, evokes a lot of loose ideas. The sources devoted to process management generally indicate three stages of the abovementioned process development:

- stage 1 emerged in the first third of the previous century and is connected with Taylor's theory of management. This approach was implemented in practice. Characteristic feature of that period of process management was the fact that no automation form of process management was used in the process of application;
- stage 2 introduced a concept of "process management" denoted as the approach of "business process reengineering", while processes being manually "reengineered". The approach was also characterised by focusing mainly on the management of micro-processes, which is simultaneously a limitation of this approach;
- stage 3 of process management is associated with the last decade and is characterised by its orientation rather on the complex economic organisation than on particular processes. Characteristic feature of the period is "change". In this approach, the organisation capable of change is more valued than that being a market leader in the field, since change represents a perspective element in managing an organisation. If an organisation becomes a market leader, yet is not capable of change, it is supposed to lose its position in future. The period is

simultaneously characterised by thorough automation of process management, however oriented on new or newly designed processes.

The abovementioned division of process management illustrates that so called process approach as a prerequisite of ISO standards for quality management systems practically concerns only Stage 1 of process management. In the application of process approach in quality management systems, neither implementation of automation in process management, nor changes of processes and organisational structures are common. In his publication *Management Challenges for the 21st Century*, Drucker defines two important requirements or aims:

- development of a systematic and well-organised method for collecting the information on corporate activity in the field of market economy and competition;
- integration of various procedures applied separately before, e.g. value analysis, process analysis, quality management and cost management in one general procedure.

3. HIERARCHY AND STRUCTURE OF PROCESSES

Since process management has been in existence for nearly a century, there are numerous definitions of the process itself as well as process management and process approach. In order to deal with the process hierarchy and structure, it is therefore necessary to explain the key concept, i.e. process itself.

ISO standards 2000 define process as a “sequence of procedures which uses resources to convert inputs into outputs”. The output of process may be a product, service, information, etc. The ISO definition is not precise however, as it lacks a substantial aspect, i.e. meeting the customer’s expectations or requirements regarding the output. Only those process outputs bring profit to economic organisations, which satisfy the demands of a target customer. Output of a process must have certain value gained in the process of implementation. If customer appreciates the value, the process is effective; if not, the process represents a waste of effort.

Process is frequently associated with wasting material, energy or human labour. This, however, cannot be a process objective; process objective must always be meeting the customer requirements.

Regarding the above-mentioned, process represents a sequence of interconnected and usually integrated activities converting inputs to outputs and bringing some value to customers, both internal and external. A closer definition is that of W. Robson and P. Ullah who defined process as a workflow routing from one person to another, and, in case of complex processes, from one worktray to another.

Processes can be defined on any level, yet always with exact determination of the beginning, certain number of steps and clear determination of the end. This definition points at the fact that the activities involved in the process are interconnected, while the limits of activities, i.e. exact determination of the process’ beginning and end should be clearly determined.

Following is the definition of M. Hammer (7), where process is “set of activities requiring one or more input and output forms that are of a certain value to the customer”. The advantage of this definition is the emphasis on the necessity of satisfying the customer needs via the activities forming the process. In practice, managers of individual organisational structures frequently focus on performing individual process activities, while ignoring the main aim of these activities, i.e. producing an output which will satisfy a customer, both internal and external. This is typical for functional approach.

As shown above, processes are workflows with determined beginnings and endings, i.e. limits. The limits are determined by the process inputs (tangible or information ones) and outputs. When defining the process, it is necessary to consider also the subjects entering the workflow. General definition of the process subjects is shown in Figure 1.

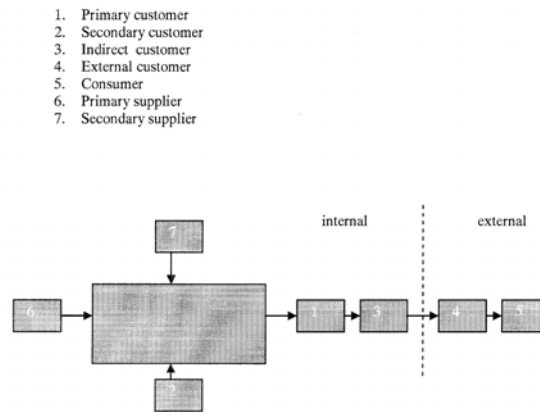


Figure 1. Subjects of processes

It obviously depends on the fact whether it concerns either internal relations i.e. meeting the needs of internal customer, or external relations.

Limits of each process are formed by primary inputs starting the whole process. As their name shows, primary inputs are delivered by primary suppliers, and they should satisfy a primary customer in the process end. As a certain process starts running, its course requires a sequence of secondary inputs necessary for the implementation of the given process (e.g. information, standards, drawings etc.). There are also secondary outputs, occurring as a by-product of given process (e.g. information again). It is worth to emphasise, however, that the only process aim in economic organisations is customer satisfaction. Generally, there are five kinds of customers, yet not all of them occur in the each process, as shown in Figure 1.

When assessing processes, it is necessary to consider their hierarchy and structure. While process hierarchy concerns the management level, process structure expresses the role of process and its function in the process of meeting the customer's needs.

When dealing with process hierarchy, I focus on the following kinds of processes:

- 1) macro-process,
- 2) process,
- 3) mini-process,
- 4) micro-process.

This hierarchy differs from the commonly used one using the concepts of process and sub-process.

Process hierarchy is important from the aspect of defining the level of management, where the process takes place as well as responsibility for the process implementation.

Macro-process is located on the top management level and represents a complex sequence of all processes running in the organisation, starting from acquiring the inputs from suppliers up to the providing outputs to buyers. Macro-process thus represents a whole organisation, and top management, in fact CEO, is therefore responsible for the implementation of a macro-process. Universal macro-process is shown in Figure 2.

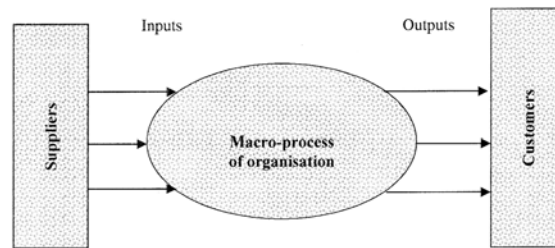


Figure 2. Universal model of macro-process.

As expressed in the title, model of macro-process is universal and applies to all economic organisations. In case of a production organisation, it buys supplies, material and energy from various suppliers, which is followed by a sequence of processes resulting in the outputs delivered to customers. The total of all these activities forms the macro-process of organisation. A universal model for service companies and even for the bodies of governmental and local administration can be similarly expressed.

Quality of output, either a product or service, means the compliance with customer requirements. In order to meet customer demands, the organisation must design and manage its macro-process so that the macro-process' outputs meet the customer requirements. Thus, in order to succeed in the market, manufacturers have to produce the products with the properties required by customers. That requires the implementation of sequence of processes described and structured by Juran in his quality spiral.

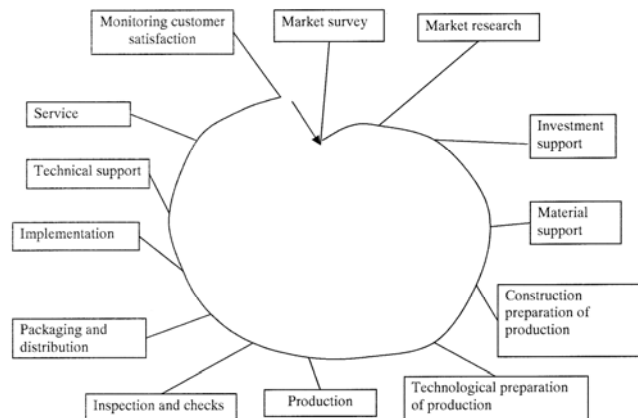


Figure 3. Juran's quality spiral

4. PROCESS ORIENTATION IN MARKETING

Marketing processes are inseparable components of organisation processes. Typical for marketing are mainly the following ones:

- decision-making on the basis of facts,
- customer orientation,
- beneficial relationships with suppliers.

I can state that marketing processes in organisation are generally focused on market analysis, marketing planning and development of marketing strategy within organisation, sales promotion and communication with customers.

The abovementioned processes also manage marketing research and survey, planning of marketing activities, management of marketing sources and utilisation of related communication tools. Marketing activities thus involve communication with customers in the stage of both, input (communication on requirements) and output (within sales promotion and communication with customers, monitoring customer satisfaction and feedback, i.e. the information flow into the processes connected with the improvement of marketing activities).

The organisations classified as medium-sized and large split marketing activities into mini-processes and micro-processes.

Each process, including marketing, must be documented and described, comprising the following items:

- name of process,
- identification of previous processes,
- identification of subsequent processes,
- determination of inputs,
- sequence of actions,
- resources (human, financial, information, material),
- facilities and infrastructure,
- process monitoring and measurement,
- data analysis,
- process documentation, including input documentation,
- records on process improvement.

CONCLUSION

Combination of process orientation in the field of marketing with the principles of quality management may represent a solid basis for business success. There is a big difference in the way the organisations apply modern marketing ideas; some actively implement marketing procedures and processes, while the others just start realising what marketing can offer within competitive environment. The differences also depend on which aspect of marketing is being preferred under given conditions. The above-mentioned factors generally define certain development phases which may lay the logical foundations for the development of marketing system in an organisation. Quality management is based on the effort to improve. Only intelligently managed marketing processes may bring benefit for organisation.

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FACTORING AS AN EFFICIENT SOURCE OF FINANCING OF WOOD INDUSTRY ENTERPRISES DURING ECONOMIC CRISIS

Abstract: the paper presents factoring as an efficient instrument of financing current activity of wood industry enterprises during the present conditions of economic crisis. The characteristics of this source of financing have been prepared presenting costs born, advantages and disadvantages of factoring. As an alternative to bank loans, factoring not only facilitates fluent financing of an enterprise, but also limits own costs as well as risk involved in economic cooperation.

Key words: factoring, liabilities, wood working industry, furniture industry

INTRODUCTION

Limited access to external sources of financing, especially bank loans is a considerable obstacle to financing economic activity of industrial enterprises during economic crisis. For several enterprises stricter conditions of obtaining a bank loan limits their access to revolving credits. It is easier to obtain a special-purpose credit, while access to financial resources for general financing is more difficult. Pressure from customers for prolongation of payment also creates difficulties in financing current activity.

Limited financial resources slow down the development of an enterprise, limit its investment activities, lead to worse financial situation that is reflected mostly in lower financial liquidity. Negative phenomena may, in consequence, lead to bankruptcy. In view of that numerous companies, also wood processing enterprises should have an adequate long-term financial reserve for financing current activities.

In the present difficult economic conditions also companies belonging to the wood sector face more and more serious difficulties with payment of their current liabilities. The level of short-term liabilities of wood processing and furniture making enterprises is presented on fig. 1 and 2:

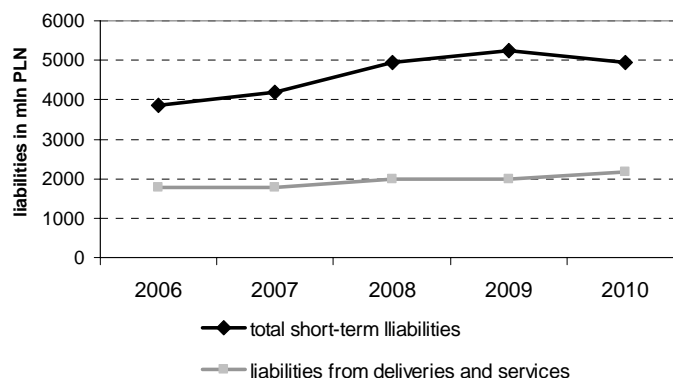


Fig.1 Short- term liabilities of wood working enterprises in the years 2006-2010

Source: autor's evaluation on the basis of CSO's data

In the years 2006-2010 systematic growth of the level of short-term debt of wood processing enterprises from 3.8 billion PLN in 2006 to 4.9 billion PLN in 2010, including liabilities from deliveries: from 1.8 billion PLN in 2006 to 2.1 billion in 2010.

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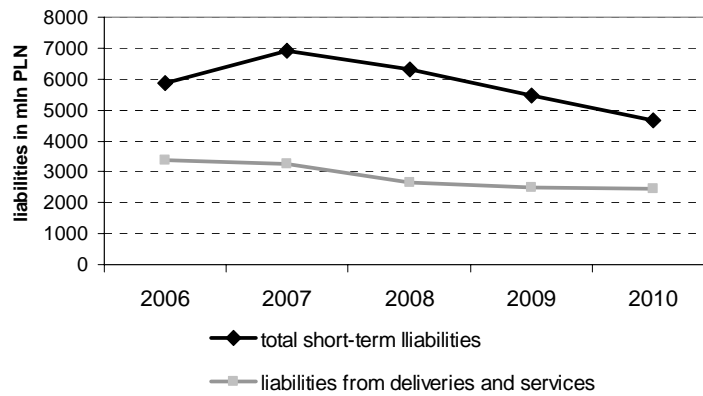


Fig.2. Short- term liabilities of furniture enterprises in the years 2006-2010

Source: autor's evaluation on the basis of CSO's data

In contrast to wood industry, short-term liabilities of furniture enterprises during the same period systematically fell from the level of 5.8 billion PLN in 2006 to 4.6 billion in 2010. It results mainly from the increase of the number of companies that use factoring in client accounts.

Due to irregularity of inflow of payments the companies find it more and more difficult to generate enough financial means to pay their liabilities from deliveries and payment obligations to the State Treasury. In the present situation when trade credits are given for long periods of time, often in excess of 60 days, and in certain cases in excess of 120 day, factoring is a right solution in terms of flexible financing of economic activity.

FACTORING CHARACTERISTICS

Factoring constitutes a source of financing that aims at introducing certain financial discipline in client accounts. Factoring is a financial service to the seller of a liability (factoring agent) that consist in buying out by by a factoring company trade liabilities with deterred payment [1]. Factoring in a company provides a number of functions that enable a company not only to obtain fluent financing and drastically reduce administrative costs as well as risk involved in economic cooperation. Main functions include:

- financing function – current financing of trade client accounts,
- protective function – taking over the risk of customer's insolvency,
- administrative function – providing services concerning the course of obtaining sums due, financial advisory service, research of debtor's condition, etc.

Conductin a number of activities by a factoring company that so far have been done within the enterprise allows to diminish administrative costs and enables to concentrate company's efforts on its basic activity.

Despite the fact that factoring is more expensive than working capital facility, entrepreneurs think highly of its advantages in the process of settling client accounts, especially those clients who have financial problems. Frequently, settling accounts with the participation of a factoring company is an adequate means that motivates and disciplines the debtor. Companies that use factoring say openly that participation of a bank in financial transactions makes the customers pay more rigorously. Moreover, in the case of full factoring (more expensive) the risk of insolvency of customer is taken over by the bank.

In 2010 the percentage of full factoring, where the factoring company takes the risk of failure to pay accounted for 48 percent of turnover. The percentage of export factoring when the factoring company purchases the liabilities of the exporter accounted for 23 percent of the turnover.

The size of the company and the level of turnover generally are not factors influencing profitability of factoring. The practice shows that factoring in a company is profitable when the annual turnover equals or is higher than 1 million PLN. Additionally, the cost of factoring services decreases with the increase of the company's turnover: the higher the liabilities the lower the price of factoring [2].

The use of factoring has a limited character and depends on specific features of client account. The requirements concerning the companies that wish to use this form of financing usually include regularity of cooperation with customers, dates of payments and type of payments. Cooperation on the basis of factoring agreement apply mainly to companies that cooperate with their customers in a cyclical way, grant deferred payment of at least 14 days, do not have mutual obligations settled by set-off.

FACTORING COSTS

Factoring as a form of financing of a company may be considered an alternative to short-term bank loans. Despite the fact that factoring is considered a more expensive option of financing current activity compared with operating loan. Taking into consideration additional services provided within this form of financing, it may be stated that it constitutes an attractive source of financing of a company. Also the cost of factoring that for numerous entrepreneurs is considered too high, in practice may be even lower than the cost of bank loans.

The cost of factoring first of all depends on the type of factoring agreement, the scope of service, total factoring settlement amount, the length of crediting period and other factors. The cost of factoring include:

- commission on the factoring loan granted paid in one installment, in the amount of about 1 percent of factoring limit.
- interest on a loan calculated on the basis of WIBOR, increased by a profit margin. The margin may range from 0.2 to 3 percent.
- factoring fee (operational fee). Depending on costs born on debt management. On average it constitutes 0.1 to 1 percent of the debt.
- insurance costs treated as additional costs that depend of the type of factoring, namely who bears the risk of customer's insolvency. In a situation where factoring company takes over this type of risk, the price of insurance is born by the factorer. Generally it amounts to 0.3-0.5 percent of the debt.

The above presentation allows to state that the costs of factoring on average should range from 8 to 10 percent of the value of debt.

FACTORING MARKET IN POLAND

At present factoring is considered one of the basic financial instruments of modern economy, that is gaining popularity also in Poland. In the recent decade the turnover of factoring has been growing every year (fig. 3). From the year 2000 average annual growth dynamics of banks and factoring companies has been about 30 percent. In this period the value of turnover of the factoring market in Poland rose from the level of 6 624 mln PLN in 2000 to 88 614 mln in 2010. It means that from 2000 it has grown thirteen times. In the past five years the number of invoices financed doubled from 1.4 million in 2005 to 3.2 million in 2010. About 3200 companies use factoring services at present.

In the years 2008-2010, that is in the period of serious crisis, the number of economic entities cooperating within the factoring agreement rose systematically (fig. 4). In this period the number of factorers total in Poland rose from 4789 companies in 2008 to 5622 companies in 2010. It has to be

stated that the dynamics of the increase of factorers was caused mainly by increased interest of the processing industry. The number of companies rose from 1470 in 2008 to 1938 in 2010.

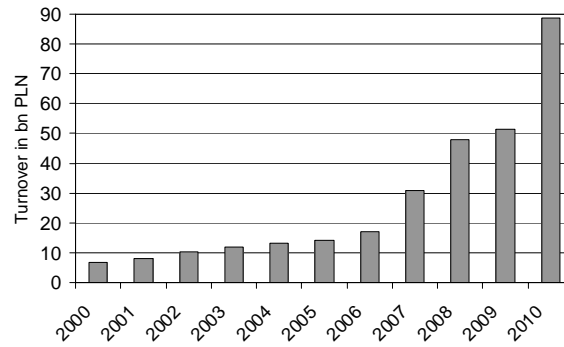


Fig.3. Turnover of polish factoring market in years 2000 – 2010

Source: autor's evaluation on the basis of CSO's data

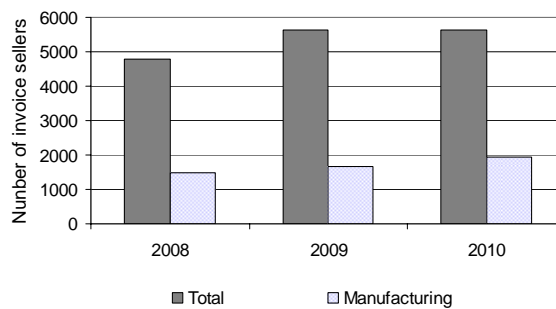


Fig 4. Number of invoice sellers in Poland in years 2008 – 2010

Source: autor's evaluation on the basis of CSO's data

CONCLUSIONS

Taking into consideration limited access to operating bank loans, especially recently, factoring may turn out to be a serious alternative to external short-term financing of a company. Factoring is an efficient instrument enabling to maintain and improve financial liquidity. It has several advantages, but is not free from disadvantages. The main advantages include constant inflow of financial means, limiting of own costs, increased credibility of factorer, reduction of exchange risk for exporters. The disadvantages include increased complexity of the service compared with a bank loan, higher costs, lack of interest of factorers debts of short maturity period, increased risk of resignation of a debtor from cooperation when he is informed of a factoring agreement signed.

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LASER AND PLASMA TECHNIQUES IN APPLICATION OF HM ADHESIVES FOR EDGE BANDS TECHNOLOGY OF BOARD ELEMENTS IN FURNITURE INDUSTRY

Abstract: Some problems of the production of the new type decorative edgebands with the functional HM adhesive layers and application of this products for veneering of board elements in furniture industry, in on line technology, with applied laser radiation and plasma techniques was characterized. Some problems of economic-technological aspects of applied of edgebands fusion technology was presented. Described heating operation systems upon the functional adhesive layers, using a laser or plasma techniques. In this context presented the following position of costs (investment, energy and safety). Demonstrated effectiveness of production in application of HM adhesives with lasertec (CO₂) for selected industry solutions. For example strength and heat resistance of glue joints with polypropylene (PP) edgebands with the functional thermoplastic polyurethane (TPU) adhesive layers to MDF was showed.

Key words: HM adhesive, edgeband, laser radiation, plasma technique, veneering, furniture industry, technology, productivity, energy, economic relation.

1. INTRODUCTION

To disadvantages of HM adhesives used for gluing technology of edge-banding board elements in the furniture industry, include the need to apply with rollers, in very large quantities, which is determined by technical reasons, connected with very high viscosity of these products (in the melting temp. 200°C apparent viscosity contained typically in the range of 50 000 to 300 000 mPa·s). In applications of HM adhesives offered in versions of unfilled products, the minimum spread, followed by application of 150 g/m², while containing fillers systems 250÷400 g/m² (depends on the quantitative-qualitative composition). It is worth mentioning, that from the viewpoint of bonding theory the aim is to formed glue lines with at minimum thickness in order obtained adhesive monolayers [12]. Generally the above spread are in complete disproportion to the fundamental canons of above mention theory, which assume minimizing the thickness of the glue lines and spreading adhesives in the range 40÷50 g/m² (per solid content). Applying of HM adhesives in such large amount, that makes obtained glue lines with significant thickness which very visible, and by very favorable characteristics in terms of strength and resistance are characterized. The thicker glue lines indeed the adverse relationship of the adhesion-cohesion forces, which automatically transferred into the quality parameters of glue lines. In a special way this question is reflected especially in the case of filled adhesives, that are applied as already stated in far larger quantities, and are characterized by a lack of transparency. Visible glue lines decrease the aesthetic-decorative features of the furniture and interior furnishings. Another technical problem rather cumbersome in conventional technologies of gluing of edges is technical support of adhesives melters (implying a lot of practise problems), which constitutes an important element in the application processes, to a large extent determine a possibility of automatization, and especially the velocity of technological line, also affecting the balance of consumption electricity and production efficiency.

In light of this, for many years in various research centers were created and taken a lot of approaches projects on a solution to the problems highlighted in order first obtained thin, virtually

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invisible glue lines systems known as "joint-less" or "zero joint", while elimination of overlapping operations processes adhesives and problems in the functioning of melters and increase productivity and production efficiency. Solutions that prevailed during the course increased the quality of the aspect of the glue lines, especially in the strength and thermo-resistance (heat, moisture, steam action). One of the promising ideas, has been known for a long time the idea of imposing HM adhesives on edgebands, where the fundamental unsolved problem was efficient and rapid heating, and thus the expiry of adhesive layer.

In 2008, independently in several centers, taking into account this idea, in connection with progress in materials science and technology of the new solutions were developed in scope of decorative edgebands with adhesive functional layers with successively implemented at short intervals of three generations of technologies and devices for heating iron-on adhesive technology on line, in the versions in succession gas lasers (CO₂), then diode (LED), and recently plasma techniques (Table 1) (1-6, 8, 9, 14, 15). Achievements, were never as yet technically-oriented and comprehensive elaborations. Very scattered information preparing people often involved in marketing, not possessing adequate knowledge of adhesives and gluing processes. The current knowledge of these problems is unfortunately insufficient, and many times it happened that at various forums, promoted also baseless slogan that offered an innovative edge with non-adhesive systems. This kind of determination to qualify in the category of deep confusion, since the adhesive is applied by the manufacturer of tape edges, in the form of functional thin film.

In this context the study was prepared, whose aim was to present and analyze the new edgebands with adhesive layer, intended for veneering of board elements, the technology on line, using the techniques of laser radiation or plasma techniques. In addition, the presentation of technical achievements, focusing on selected aspects of the cost of the proposed solutions in relation to the quality of obtained glue lines.

2. EDGES WITH ADHESIVE FUNCTIONAL LAYERS

Offered edges consists of two layer: appropriate decorative and functional. Decorative layers with a thickness from 1 to 3 mm, is usually made of thermoplastics, usually based on polypropylene (PP) or acrylonitrile-butadiene-styrene (ABS), less often of polyvinyl chloride (PVC) or natural veneers. Another type of tape edges (versions up to 0.5 mm thick) are manufactured on special papers, impregnated with melamine-urea-formaldehyde (MUF) resins. Decorative layers are offered in various colours in a monochromatic version, or through analogue or digital printing technology, imitating structure of various materials, usually basis on natural wood [7]. The functional layer of an adhesive based on thermoplastic polymers, having a specialist the ability to liquefaction and thermal reactivation, such as polyurethanes (TPU) or polyolefins-PO [11,13]. To increase the radiation absorption coefficient, is introduced into the admixture of typical adhesives different absorbers such as benzophenone or its derivatives, thus minimizing thermal damage to the surface, in relation to the decorative layer of outer edge. Preformed adhesive layers have a thickness in the range of values 0.05 ÷ 0.10 mm, which already to some extent brings them to the already mentioned in the introduction of the expected number of applicators 50 to 100 g/m². While having regard issues related to the quite significant penetration of adhesives commonly used cross-section of MDF, these quantities are always higher. In the process of the gluing edge, as a result of formers pressure to suit creates the invisible adhesive glue lines, while the laminated materials, create a homogeneous area, and occurring in the visualization system are determined by such terms as forcing, feather or welding, which has a beneficial effect on endurance resistance and obtained connections.

3. DELIVERY SYSTEMS OF HEAT ENERGY TO ADHESIVES MELTING

The new technology was the extensive cooperation of various companies, representing, respectively adhesives (e.g. Jowat, Klebchemie), polymers and edges (e.g. Döllken, Rehau), kitchen furniture (Bulthaup) and advanced industrial equipment (Homag, ImA).



Effective systems of concentrated heat transfer is based on successively implemented with the use of generations of technical solutions dispensed in a continuous mode of laser radiation energy, respectively, in the version of gas (CO₂) and LED, and later on techniques based on plasma discharges. Selected solutions that deliver significant opportunities for precise temperature control and the transmission in a continuous manner sufficiently high dose of energy necessary for the rapid heating of the functional layer, the temperature of melting adhesive, and thus its liquidation, and plasticity, together with appropriate modification of the decorative layer and then homogeneous combination of MDF board, with no visibility of the glue lines. It should also be noted that laser and plasma techniques, modified polymer layers of the edges, preferably by adjusting the relationship at the interface in the system: polymers in the decorative layer - adhesive – MDF. In general, indeed polymers are naturally hydrophobic and are characterized by a low surface free energy, which greatly limits their wettability by the adhesives. The use of laser radiation and the plasma causes the modification of the nature of complicated physical and chemical processes, generating in the surface layer of polymers formation of polar functional groups and favorable changes in the structure of geometric surfaces too [16-18]. In Table 1 in terms of comparison functional of heating operating systems of the adhesive layers were characterized. Analyzing data from Table 1, pay attention to high cost of technical solutions offered and their express desire to reduce in the following generations. For example, a CO₂ laser operating in continuous mode of long electromagnetic waves ($\lambda = 9-11 \mu\text{m}$), is the highest power unit (average 10 kW). Upper limit of laser radiation generated by CO₂ lasers determine, which are also characterized by the lowest price, life time 4-5 years (in one work shift) and the highest energy efficiency (up to 20%). It is worth mentioning in this context that melters for HM adhesives have the average electricity demand on the level 17 kW. Laser radiation and plasma supplies offer great opportunities in the energy adjusting to the type of edge, and their colours and properties of thermoplastic adhesives, such as allowing implementation of the "melt on demand". Due to the type of the polymers, and their colours, chosen is called modulating of the laser. In case indeed various polymers are different phenomena related to reflections, absorption, and ablation, which results in the transformation of energy. The most problems create white edgebands, which reflect intense laser beams, which can interfere with processes of adhesive melting. When using a CO₂ laser can carried out gluing boards operation (up to 50 mm) at a velocity of 18 m/min and for firming corps parts (to a thickness of 19 mm) and fronts (up to 22 mm) at velocity of 30 m/min [9]. Generally assumed that lowering the velocity of the process, eg. from 30 to 20 m/min, can save electricity by 20%, while increasing the value to 50 m/min results in an increase in energy consumption to 150% [14].

Table 1. Characteristics of heating operating systems upon functional adhesive layer using a laser or plasma techniques [8,9,15]

Characteristics	Thermal energy supply system		
	Laser in version		Plasma
	CO2	LED	
Investment cost [€]	450 000	150 000	<100 000
Energy requirement [kW]	20	7	7.5
Conducting energy methods	oscillating mirror system	optical beam systems with a special projector lens, whose mission is to shape and conduct the appropriate laser beams and pass them on the functional layer of the edgebands	optical beam systems, so-called plasma nozzles
Safety	dangerous for technical staff, may cause burns of the skin, posing a risk to eyesight, additional safeguards are required laser work zone		safe for human
Energy stream	the thin edge can pass through the cross section of edge, so the materials engineering must apply special safeguards absorption, focusing mainly energy in the functional adhesive layer		heats only the adhesive functional layer of edgebands

4. PROPERTIES OF GLUE LINES AND COSTS

Well-known adhesives producers, for example, in the Comp. Klebchemie MG Becker GmbH & Co. KG. has been implemented into industrial practice specialty HM adhesives, respectively with trade names Lasermelt® Kleiberit and Lasermelt® 787 PO 786 intended for the manufacture edges to laser technologies. These adhesives are available in a wide range of colours (white, ivory, mahogany, black), with application temp. of 200-230°C, and apparent viscosity 70 000 mPa·s (200°C). These adhesives are preferred in particular to the edges based on synthetic ABS, PVC and polyester polymers, and also for materials on paper impregnated with MUF resin. The recommendations of these adhesives, given that the resulting connections are characterized by high thermal resistance, conditioned by the kind edges (depending on the edge material), which calls for the specified adhesive reaches the level of >140°C [4, 5].

In turn, in Jowat AG Comp. developed HM specialistic adhesive based on TPU, with the trade name Jowat 213.60-Purtherm®, designed for applications using LED lasers. In the Table 2 are given selected properties of the glue lines, which was used as a functional layer for gluing on the PP edges (at thickness 1.2 mm), without the participation of adhesion promoters. Given above results were obtained in experiments leading on Lasertec technology line of Homag Comp. [3,10].

Generally it is assumed that in the case of conventional solutions to the strength of HM adhesives connections based on EVA copolymers, does not exceed 50 N/cm, while in the case of TPU adhesives and laser techniques can achieve up to 100 N/cm [7].

Table 2. Strength and heat resistance of joints with PP edgebands with the functional layer of Jowat-Purtherm ® 213.60 adhesive (various spread) to the MDF in Lasertec-LED [10]

Parameters	Functional layers formed with adhesive in spread [g/m ²]	
	120	180
Tearing strength of glue lines [N/cm]	41	53
WFP factor [%]	90	90
AWT thermoresistance (samples preheating 1 h in temp. 120°C)	no changes	
WLT thermoresistance (samples preheating 28 days in temp. 50°C/RH 20%)		

At Homag Group AG, an analysis of the effectiveness of the technique for application of CO₂ lasers for HM adhesives application in two solutions, respectively, in versions online technology and CNC machining center (Table 3).

Table 3. Effectiveness of the use of HM adhesives with lasertec (CO₂) for selected industry solutions [6]

Specification	Technical solution in edge banding gluing	
	„On line” system	CNC machining center
Energy safety [kWh/year]	36911	2250
General energy safety [%]	40	20
Consumption of CO ₂ [Mg/year]	26	1.6
Final financial effect [€/year]	4430	270

5. RECAPITULATION

Decorative edgebands with thermoplastic adhesives functional layers with successively implemented at short intervals of three generations of fusion technologies for veneering of board elements in furniture industry. Decorative layers with a thickness of 1 to 3 mm, is usually made of thermoplastics, usually based on polypropylene (PP) or acrylonitrile-butadiene-styrene (ABS), less often of polyvinyl chloride (PVC) or natural veneers. The functional adhesive layer based on thermoplastic polymers, having a specialist the ability to liquefaction and thermal reactivation, such as polyurethanes (TPU) or polyolefins (PO). Setting up special devices for heating on adhesive technology on line, in the versions in succession lasers of gas system (CO₂), then diode (LED), and recently plasma techniques. Pay attention to high cost of technical solutions offered and their

express desire to reduce in the following generations (from 450 000→100 000 €). Cost effectiveness of the applied of edgebands with functional HM adhesives application with lasertec (CO₂) system for selected industry solutions is rather little. Final financial effect for consider variants in compare with conventional system was appropriate - for CNC center 270 [€/year] and in “on line” technology 4430 [€/year]. In this technology obtain glue lines with no visible joints and very high parameters particularly in thermoresistant level values >140°C.

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RATIONALIZATION OF PACKAGING MANAGEMENT IN MANUFACTURING ENTERPRISES

Abstract: Rationalization of packaging management can be involved into basic logistics managerial functions. Packaging systems and management in this area is part of the logistics system and it highly participate on enterprise budget. Rationalization of this managerial system can be done by the application of sophisticated integration system (Supply Chain Management) or by outsourcing of packaging which both can lead to further business development.

Keywords: packaging management, logistics, Supply Chain Management, outsourcing, rationalization.

1. COSTS OF PACKAGING

To the cost of packaging, which consists of all inputs and outputs to the package, must be added costs for waste liquidation, costs of damages caused by packaging, movement of returnable packages etc. The costs for packaging related to one package can be expressed as [1]

$$(E + ((x-1) \cdot R) - A + L + K + P + S) / (XM)$$

There are costs per one unit. Variables explanation is the following:

- E- cost of packaging material,
- R- re-feeding of packages value of old material,
- L - personnel costs,
- K - capital costs,
- P - cost of outsourced performances,
- S - damages caused by packaging,
- x - frequency of packages utilization,
- M - packaging materials.

Figure 1 shows the relationship between the loss and damage on the goods and packaging costs.

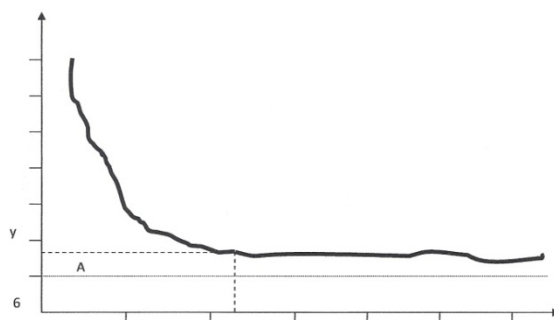


Fig. 1 Optimization of the packaging costs [2]

- x - packing costs in% of total costs,
- y - the loss of goods in% of sales turnover.

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Optimum packaging costs (assessed individually for each case) on the curve are described as the intersection of E and G and it represents the sum of costs and losses of absolute values calculated from the related basis by a percentual share. CB represents the lower critical level below which losses cannot be impacted by further costs increasing. [2]

2. INTEGRATION OF MANAGEMENT THE LOGISTICS PROCESSES (SCM)

The basic goal of business logistics is to achieve optimum service levels for customers by taking into account minimum cost. However, these two parameters have contradictory effect. In the first, there are increasing customer demands on speed, quality and flexibility of supplies and on the other hand there is problem of price competitiveness, so there is a pressure on permanent searching of potentials for logistics costs reduction. In this situation, there is no place for particular optimization of single logistics parts of the whole logistics chain, but it is required systemic approach and conceptual solution of the whole supply chain "from the supplier of your supplier to the customer of your customer."

SOLUTION

The essence of Supply Chain Management (SCM) is the integration of all logistics parts in the whole supply chain into singular system, managed on the base of single planning system. The key to effective SCM system is the investigation of three main areas:

- material flows (distance, volume and frequency),
- stocks (quantity, value, turnover),
- planning and managing processes of material flows and stocks (methods, organization, information availability, IT support, controlling tools).

The essence of supply chain optimization is to find the key performance parameters for each chain part, analysis of their mutual interaction and opportunities of optimum achievement within the whole supply chain. So, the optimum supply chain is the mutual compromise of its singular parts.

Framework of the solution.

The definition of SCM strategies:

- definition of the basic mission and goals of supply chain,
- creation the basic concept of supply chain integration in the company and towards suppliers and customers.

Mapping and optimization of material flows (supply chain configuration):

- identification and quantification of material flows
- allocation and volume of stocks
- applied manufacturing and logistics technologies
- assessment of parameters for singular supply chain parts

Mapping and optimization of supply chain processes:

- understanding a course and logic of processes along the whole supply chain, adjustment of processes in order to reach continual material flow and minimum stocks,
- solution of methods, mechanisms and tools of planning and its integration; providing the necessary information and methods of its sharing in the planning of all singular parts of supply chain,
- elimination of organizational barriers and assessment of effective motivation system,
- definition of new requirements on IT support for functionality, data flows and information systems.

Definition of performance parameters and metrics: definition of parameters, systemic settings and check pilot verification of managerial parameters and control indicators of logistics controlling

Benefits

There are the main benefits of a successful project:

- 1) integration of planning and managing of supply chain. This is primarily a production planning according to customer requirements (forecast), which lies in the more effective management of final products inventory, what means reduction of inventory volumes (increasing turnover),

reduction the volume of dead stocks, higher flexibility of supply as well as secure supply to customers what means decreasing of inventory deficit. Another benefit is the material supply just according to the actual needs of production, which lies in the more effective management of material stock levels, resulting in a reduction of stock volume, more secure supply of material into the production and higher utilization of production facilities. Finally there is integration with suppliers, visible mainly in the form of orders automation,

- 2) integration of planning in all production stages. As a significant can be mentioned planning of semi-products, what leads to the reduction of stocks volume,
- 3) Optimization of material flows. This leads to the reduced of distribution costs, manipulation costs and packaging costs.

3. DIVISION OF PACKAGES CIRCULATION FROM THE MANUFACTURER

Outsourcing is mainly used in activities such as transport and warehousing and its application can lead to decreasing of costs from 10% - 25% to 4% of total logistics costs. This level of costs cannot be reached only by producer.

Outsourcing of packaging is relatively new area of outsourcing application. Supply chain subjects - manufacturer, importer, wholesaler and retailer - are involved in the circulation cycle of returnable packages. Above all, manufacturer should have:

- enough returnable packages to ensure the production process,
- final products packaging into returnable packages,
- distribution of goods to a customer,
- delivery of returnable packages from customers,
- reconciling the volume of delivered and returned packages,
- assuring the quality and cleanness of packages,
- warehousing of packages,
- reparation, production and purchasing of new packages,
- inventory audit,
- staffing of appropriate employees dealing with packaging.

It means that all these activities are time, finance and space demanding. Business partners must find a system of cooperation, to assess the conditions and to determine the circulation system of packages. Circulation cycle of returnable packages means to choose a system:

- to spare packages for a customer
- to register packages on package account
- to sell packages directly with a final product
- to separate the whole packages circulation by outsourcing

Each of these above mentioned systems have their strengths and weaknesses. It is necessary to identify them, analyze them and to choose the most suitable one. It is also necessary to analyse costs. Many companies cannot assess cost of the whole cycle of returnable packages and especially costs per one unit of package or they do not deal with such a problem of costs assessment.

Cost analysis has decisive impact for the choice of appropriate and effective economic system of returnable packages circulation cycle. Outsourcing of packaging activities have a great impact on the management of each company.

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MANAGERIAL COMPETENCIES AND PURPOSE OF THEIR ASSESSMENT

Abstract: Managers and their ability significantly influence success of companies. Managerial competencies as a set of skills, knowledge and ability to successfully meet the challenges may have a crucial role in achieving company competitiveness. To understand and be familiar with these competencies is important for companies business. Article focuses on the application of a competency approach in selected companies in Slovakia and describes assessment of managerial competencies.

Key words: competency, competency model, managerial competencies

INTRODUCTION

Improvement of managerial work is one of the main tasks of human resource management in companies. It is because fact, that only well-prepared manager can provide desired results. Main development requirement therefore is to educate the managers to be qualified leaders who can focus on strategically important issues and effectively engage employees to provide required performance. Recent trends bring to the management and human resource development competency model approach.

Basis of competency approach is the adoption of competencies as the basis for the recruitment, performance assessment, development, training and career planning of employees. Competencies can be expressed in behavior. Competencies that managers need for they work are called managerial competencies. These competencies should ensure achievement of high performance, reflected in the tasks to be fulfilled in accordance with strategic plans. Using these competencies should help to create a motivating work environment for employees.

As competent in a particular area used to be consider a person who has the abilities, motivation, knowledge, skills to do well what is required this area. The definition of competency is a set of skills, knowledge and abilities necessary to successfully manage someone's roles and tasks. (Kucka M., Maníková J. 2001)

Crucial to managers' success are such qualities which represent a set of native individual characteristics of individual and acquired knowledge, skills and experiences. E.g. the ability to manage, the need of power and empathy can be mentioned as native characteristics. Literacy, professional skills, soft skills etc. can be considered as acquired characteristics. These characteristics individual person enhances whole life.

Key competencies can be regarded as not only a set of skills and knowledge but also abilities and attitudes. Individual person acquires and develops this set throughout its life. The process of acquiring these skills is not just a matter of education but also training that he receives and the typology of human beings as individuals, their dispositions, intelligence, and to some extent also talent, especially in the areas of communication, creativity, and so on (Birknerová Z., Zahatňanská M. 2009).

Knowing and understanding key managerial competencies is extremely interesting for company human resource specialists. They need to know managers behavior that contributes to the success performance at manager positions.

For competencies identification can be used a variety of techniques, methods of detailed analysis, observation of activities or detection of individual characteristics of managers on different positions in company hierarchy.

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After identifying and defining competencies follows formation of competency models for different job positions. A competency model includes a set of selected competencies, which are ordered according to a key to the logical structure and interdependencies.

Competency model can be also seen as connection between company values and job description. It would thus effectively link business strategy with human resource strategies. Competency model itself is not the goal to which we should tend, it is only a tool to achieving company objectives as efficiency and performance increase. (Horváth L. 2007)

Competency approach so allows linking the effectiveness of the individual to the effectiveness of the organization. It enables to effectively manage individual performance by focusing on his real behavior and acting.

The essence of performance as an economic category is composed by three elements. The first is to define the target level against which is compared actual performance with the required performance. The second element is criteria of the goals evaluation - an indicator or set of indicators. The third performance element is system of its measurement and evaluation, which defines rules for indicators measurement and methods of evaluation. (Kuchárová Mačkayová, Závadský 2006)

Competency approach so can help to improve employee performance management in organization.

THE RESEARCH OF APPROACH TO THE MANAGERIAL COMPETENCIES OF COMPANIES IN SLOVAKIA

Survey focused on approach of companies in Slovakia to the managerial competencies was carried out last year. We identified approaches of company managements to the issue of competencies and competency models creation by this survey. Statistical sample of questionnaire survey consisted of industrial enterprises operating mainly in the automotive, engineering, construction, electrical and also in wood industry in Slovakia. Companies for this survey were selected randomly. From total number of 350 questioned companies, in the questionnaire survey participated 84 companies, representing 24% of returned questionnaires.

We reviewed, if there are created competency models for management positions in companies participating in carried out survey. We focused on to determine whether are for a specific position defined competencies needed for good performance ordered into specific competency models for specific managerial positions. The results are illustrated graphically in the fig. 1. 51% of respondents said their companies have developed competency models, 32% of companies do not and 17% of respondents did not know whether their companies have created competency models.

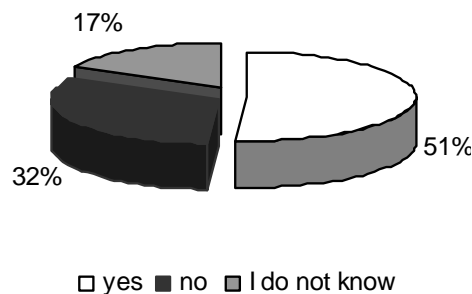


Fig. 1. Existence of competency models in companies

In the survey, we also tried to find out whether in the companies human resource specialists investigate the consistency between the attained level of competency among managers and the required level for their job. The result is illustrated graphically in the fig. 2. The question was

answered by 10% of respondents positively, by 76% of respondents negatively and 14% of respondents do not know if their human resource specialists measure the level of manager competencies.

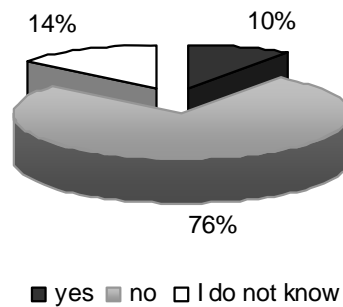


Fig. 2. Measurement of achieved level of competencies for specific managerial positions

Based on carried out research, we realized that not every company human resource managers understand and use competency approach to the same extent. Although 51% of respondents stated that the competency model is created in their company, only 10% indicated also the measurement of the competencies achieved level. System of interconnection of competencies with performance management, which has an impact on other areas of employee work life, is actively used in only in few surveyed companies. The competencies and competencies assessment became only formality in the most enterprises.

Based on carried out research we found out, that various management competencies are required and given in competency models in different individual companies. Despite that can be identified general set of competencies that are used in all companies. The need of these competencies was developed on the basis of the accepted values, principles and strategies of individual companies. The most frequently reported are the following four competencies:

- company values assertion,
- leadership,
- employee development,
- strategic thinking.

As competencies that have efficient manager are usually considered desired behavior, which is based on corporate culture and the need for success in a market.

ASSESSMENT OF MANAGERIAL COMPETENCIES

There is a need to find out what is the difference between the actual and desired state of competence in the companies. The purpose of assessment of managerial competencies is improvement of management quality and performance of managers. (Rašínová I., Nosková Š. 2009)

Assessment of competencies can be considered a tool for feedback. It provides a picture of the strengths and development areas of assessed employee. It compares the current management competencies with the desired state; identify the potential and development needs.

Company assessment system should be in line with the corporate culture, supported by company management and should have a unite form, be effective, administratively easy, continuous and affordable for everyone.

Assessment of managerial competencies is useful to perform mainly in following occasions:

- **Regular (e.g. annual) assessment** – is carried out in the form of ongoing dialogue between employees and managers, once per each review cycle (e.g. calendar year). This assessment is determined for all managers or employees. It should include assessment of work and performance objectives and assessment of competencies (achieved level of competencies). Through achieved

goals is assessed level of desired behavior, or competency. There are assessed only competencies which are associated with assessed job position. Thereafter follows discussion of development and training program for assessed employee. Outcome of the meeting should be recorded. Assessors need to be retrained in the scope of competency model and providing feedback. Disadvantage is that although the assessors are trained, assessment meetings are not uniform and also often there can be found subjective conclusions.

- **Assessment in recruitment** – designed just for applicants for particular job positions and attended by participants of selection procedures. Competencies and their required level measured during selection procedures implicated from recruited job positions and its job description. Preparation of a selection procedure is task for human resource management. As the most common form of competencies assessment implementation are assessment centers. The form of assessment center contains of collective and individual tasks that are focused on measured competencies. Individual personal interview should not be missed during selection procedure. Assessors are direct supervisor or another manager who has a similar job and human resource professionals who are also the moderators of the selection process. Before each assessment center are managers properly trained to provide objective assessments, which can be mutually compared. Training is realized by human resource specialist or professional recruitment agency consultant.
- **Assessment in career planning** - designed for managers and employees involved in career planning. Individual managers are involved in this program due to preparation for senior management positions. Nominations for this program should be made on the basis of an excellent annual assessment. Managerial competencies are recommended to be assessed using development centre or using psychological and personality tests. Form of development centre is similar to assessment centre. Represents a moderated meeting, where participants are engaged in collective and participate in structured personal interview. In development centre in contrast to assessment centre are monitored all manifested competencies and all their levels, not only those required for the particular job position. Assessors and interpreters of feedback should be trained human resource professionals and external consultants from personnel or training agencies. Psychological and personality tests should be assessed only by psychologists. Development centers are difficult to be prepared, but also to be implemented according to their content and the time schedule. Therefore development centre absolve only employees involved in career planning programs.

CONCLUSION

Competencies can help to describe the desired behavior of managers and other employees, which finely lead to the fulfillment of business objectives. It is important to realize if company management wants to map current key competencies that meet current successful managers or wants to take into account future expectations to fulfill the company's businesses performance in terms of managerial behavior.

The advantage of future expectations of managerial behavior is that a business can respond quickly to rapid changes brought by a highly competitive environment.

Top management should be involved into creation of competencies and competency models if they have to be functional and fully used. Tasks for managers at strategy level are not only to accept the idea of competency, but also actively use and promote competency approach also at lower management levels and other positions.

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SITUATION OF ENTERPRISES IN THE WOOD SECTOR IN THE PERIOD OF OVERCOMING ECONOMIC CRISIS

Abstract: Work is designed to identify factors that affect businesses - especially manufacturers of wooden houses - at the stage exit from the economic crisis, an indication of problems that at this stage are the manufacturers and to show the prospects for the timber industry.

Keywords: lumber, timber, wooden structures, the economic crisis

In the period of the economic crisis many companies were forced to considerably reduce their production levels. This was obviously connected with a reduced demand for final products and changes in raw material prices. Changes occurring in the field of production in the years 2007- 2010 were determined on the basis of data made available by a selected company (Polska 2009, Sektor drzewny 2011).

Timber purchases by the analysed company in 2007 amounted to 34 400 m³. In 2008 this company merchandized almost 42 000 m³ round wood. The level of round wood conversion in 2009 during the crisis was approx. 40 000m³ a year.

In the first half of 2010 a total of 14 000 m³ wood were purchased, i.e. less than 35% average annual demand for timber by this company. Such a low level of wood purchases was caused by the difficult situation on the timber market, its high price and considerable competition. In Poland the State Forests National Forest Holding is the only supplier of wood. Due to the demand for such amounts of timber and preferred sales conditions used by the primary supplier, i.e. the State Forests, the raw material base of the company was highly scattered. In the analysed period from 2007 to June 2010 the company was supplied with wood by over 50 suppliers from different forest divisions, located within a 200 km radius from the plant site.

Table 1. Summary of quantitative and generic material provided in the first half of 2010

Wood species	Mass participation [%]
Pine	90,02
Spruce	3,321
Beech	3,10
Birch	3,06
Oak	0,48

The percentage shares in the total volume of purchased timber were determined for individual wood species (Tab 1.). It results from these data that 93% timber was softwood, of which 90% was pine wood, to be used in the production of structural elements. The quantitative and qualitative shares of the supplied pine timber were determined on the basis of information collected from the documentation. As it may be seen in Table 2 and 3, supplied pine wood varied greatly in terms of quality and dimensional characteristics.

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The share in the volume of the purchased timber indicates that a predominant pine wood mass belonged to quality grade WC0 of diameter class 2. The proportion of this class in the total volume of supplied pine timber was 45% in 2007 and 29% in 2010. For the identified diameter classes distinguished in the total timber volume class 2 was found to predominate, accounting for 67% in 2007 and 48% in 2010.

The annual distribution of produced assortments in the years 2007 – 2010 is presented in Tables 4-7. It results from this comparison that the company concentrates mainly on the production of glued lumber for export at $\sim 5\,900\text{ m}^3$ and sawn timber for furniture and construction industries at $\sim 8\,200\text{ m}^3$.

Table 2. Characteristics of raw pine 2007

Quality class	a mass of raw pine thickness groups [m ³]		
	1	2	3
WA0		5,18	2,51
WB0	1,91	16,51	3,36
WC0	15,41	44,96	9,19
WD	0,15	0,51	0,31
S10	0		
S2B	0		

Table 3. Characteristics of raw pine in 2010

Quality class	a mass of raw pine thickness groups [m ³]		
	1	2	3
WA0		4,60	2,69
WB0	4,04	12,64	2,68
WC0	27,46	29,14	11,89
WD	0,77	0,82	2,40
S10	0,02		
S2B	0,85		

Table 4. Summary of laminated timber manufactured for foreign markets in 2007

Product:	Product dimensions: [mm]			Annual production:	
	H [mm]	B [mm]	L [mm]	[mb]	[m ³]
Glued timber	48	87	6000	10 368	43,30
	48	115	6000	3 888	21,46
	63	75	6000	32 928	155,58
	72	72	6000	4 704	24,39
	72	75	6000	71 838	387,93
	72	86	6000	521 604	3 229,77
	72	105	6000	13 884	104,96
	72	115	6000	19 764	163,65
	72	145	6000	27 395	286,01
	84	86	6000	1 728	12,48
	120	65	6000	900	7,02
Glued timber "Flader"	72	86	6000	112 392	695,93
Glued bimer outer layers	72	86	-	56 918	352,44
	72	115	-	9 949	82,38
	72	145	-	14 765	154,14
Patches of pine combined	83-98	27-29	-	66 280	170,61
			sum	969 305	5 892,04



Table 5. Summary of laminated timber manufactured for the domestic market in 2007

Product:	Product dimensions: [mm]			Annual production:	
	H [mm]	B [mm]	L [mm]	[mb]	[m ³]
Glued timber	48	86	6000	300	1,24
	48	115	6000	8 694	47,99
	63	75	6000	300	1,42
	63	110	6000	360	2,49
	72	75	6000	8 472	45,75
	72	86	6000	52 246	323,51
	72	115	6000	8 151	67,49
	72	145	6000	5 058	52,81
	96	86	6000	576	4,76
	96	115	6000	1 296	14,31
Glued bimer outer layers	72	86	-	13 879	85,94
	72	115	-	7 714	63,87
	72	145	-	544	5,68
sum				107 589	717,24

Table 6. Summary of production volume in the company in 2007

Month	glued wood [m ³]				Lumber [m ³]	sum[m ³]
	for export	the country	building	homes		
January	434,72	44,15	61,24	51,15	624,59	1 215,85
February	586,87	28,28	74,14	21,24	791,57	1 502,10
March	609,83	74,23	52,26	47,53	805,11	1 588,96
April	538,93	19,16	117,48	70,85	560,63	1 307,05
May	475,52	101,22	11,86	93,92	632,37	1 314,90
June	412,99	66,34	6,34	112,15	673,89	1 271,71
July	504,21	81,81	47,31	47,28	704,93	1 385,54
August	560,81	47,94	8,40	61,40	552,07	1 230,61
September	557,18	89,27	1,97	47,73	735,33	1 431,49
October	522,22	92,37	9,07	35,82	627,45	1 286,93
November	568,77	67,91	11,29	57,96	683,82	1 389,76
December	120,01	33,15	2,38	54,34	785,09	994,97
sum:					15 919,84	

Table 7 above presents data concerning sales of square timber and sawn timber in the first half of 2010, while in Table 6 is provided a summary of lumber sold to domestic and foreign markets earlier in the year 2007. Visible is a significant change in the direction of the scale of production decline by around 20% for 2010.

Table 7. Summary glued wood produced in domestic and foreign markets in the first half of 2010

Product	Product dimensions [mm]			Half-yearly sale	
	H	B	L	[mb]	[m ³]
Glued timber	48	75	6000	924	3,33
	48	87	6000	1458	6,09
	48	125	6000	1800	10,80
	69	150	6000	48	4,97
	72	45	6000	4536	14,70
	72	75	6000	25788	139,26
	72	86	6000	248003	1535,63
	72	105	6000	12606	95,30
	72	115	6000	3900	32,29
	72	125	6000	2916	26,24
	72	145	6000	8496	88,70
	84	75	6000	1764	11,11
	84	86	6000	17658	127,56
	90	90	6000	450	3,65
	96	86	6000	12528	103,43
	96	105	6000	1920	19,35
	96	115	6000	1350	14,90
	96	145	6000	372	5,18
110	62	6000	768	5,24	
Glued bimer outer layers	72	75	-	2842	15,35
	72	86	-	43189	267,43
	72	115	-	1004	8,32
	72	145	-	864	9,02
	84	86	-	10208	73,74
	84	145	-	751	9,14
sum:				406143	2630,73

CONCLUDING REMARKS:

In view of the problems and aspects of functioning of an enterprise from the wood industry sector, presented above for the analyzed and actually operating company, we may formulate the following statements:

1. The world economic crisis had a dramatic impact on many branches of production, including also a very strong effect on the wood sector. In case of sawn products and converted products a reduced demand observed on the part of buyers is connected with a decrease in the level of investments and limitations in terms of their credit financing. Restoration of production and sales to the levels from the period before the crisis and its increase will require stabilization of economy in the following years.
2. An increase in the prices for timber in case of the main domestic monopolist, i.e. the State Forests, has a negative impact on wood production and thus the development of the sector, including wood home construction.
3. New requirements concerning the use of certified wood for the needs of wood home construction may in the nearest future have a negative impact, contributing to an increase in manufacturing costs and thus to a reduction of production levels.

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